PB86-217635

Field Sampler Training Course Manual

(U.S.) Environmental Protection Agency
Seattle, WA

May 86

U.S. Department of Commerce
National Technical Information Service

50272-101

REPORT DOCUMENTATION PAGE	**1. REPORT NO.** EPA 910/9-86-141	**2.**	**3. Recipient's Accession No.**

4. Title and Subtitle
Field Sampler Training Course Manual

5. Report Date
May 1986

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

U.S. Environmental Protection Agency Region 10
Environmental Services Division
1200 6th Avenue
Seattle, WA 98101

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

For a variety of reasons, field sampling has become more complicated both technically and administratively. Uniform procedures for field sampling activities are needed.

The Region 10 Field Sampler Training Course is intended to aquaint EPA samplers with the important elements for successful field sampling. The information provided in the Field Sampler Training Course is part of a larger training program for EPA field inspectors covering administrative, technical, legal and communications aspects of field sampling, inspection and compliance activities. The material is presented in the logical sequence of a typical sampling exercise as shown in the table of contents. The course is intended to present the proper procedures and to explain the reasons for the procedures. The manual can be used as a reference to remind you of the critical elements of a field sampling project. It is not, however, intended to be a comprehensive treatise on field sampling.

Each section of the manual is numbered and dated. Revised sections will be distributed when any significant change is made.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	**19. Security Class (This Report)**	**21. No. of Pages** 106
	20. Security Class (This Page)	**22. Price**

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

United States
Environmental Protection
Agency
Environmental Services Div.

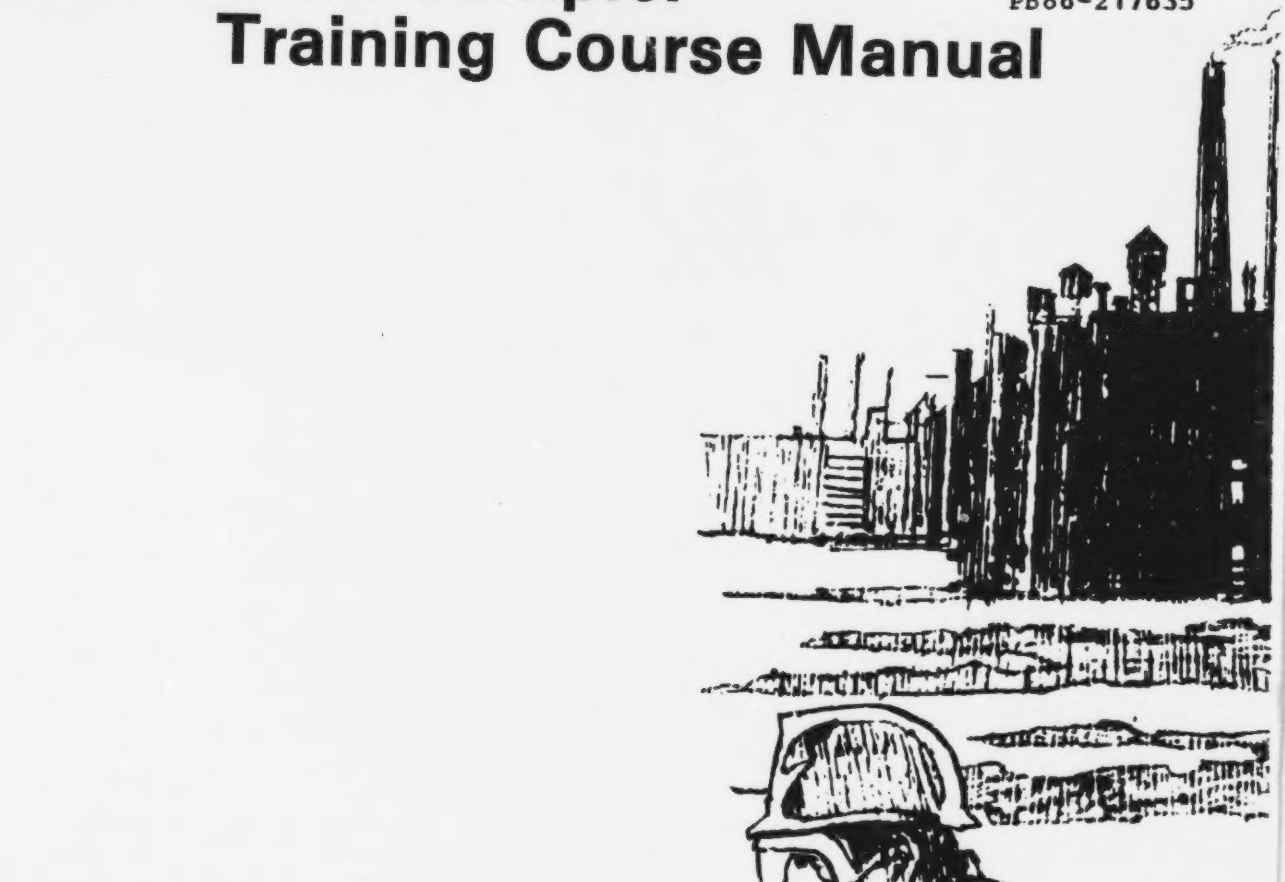
Region 10
1200 Sixth Avenue
Seattle WA
May 1986

Alaska
Idaho
Oregon
Washington
EPA 910/9-86-141

EPA

Field Sampler Training Course Manual

PB86-217635



REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

EPA REGION 10
FIELD SAMPLER TRAINING COURSE
MAY 19, 1986

AGENDA

Time	Topic	Speaker	EPA Phone Extention
9:00	Introduction	Dick Bauer/Paul Boys	1567
9:15	Quality Assurance	Roy Jones	7373
9:45	Sample Control Center and Administrative Procedures	Joyce Crosson	8562
10:10	Sample Equipment Assembly and Cleaning Procedures	Andy Hess	0370
10:20	Break		
10:45	Elements of Field Sampling	Paul Boys/ Dan Tangarone	1567
11:00	Field Documentation	Dan Tangarone	1630
11:40	Labeling, Packaging & Shipping	Andy Hess	0370
12:00	Lunch		
1:00	Sample Shipment Logistics	Andy Hess	0370
1:15	Safety	Ron Blair	0370
2:00	Data Access	Joyce Crosson	8562
2:15	Legal Considerations	Dave Heineck	1498
2:45	Laboratory Considerations	Steve Pope	0370

5/86

EPA REGION 10
FIELD SAMPLER TRAINING COURSE MANUAL

TABLE OF CONTENTS

	Chapter	Page
1.0	INTRODUCTION	1-1
2.0	QUALITY ASSURANCE PLANS	2-1
3.0	SAMPLE CONTROL CENTER AND ADMINISTRATIVE PROCEDURES	3-1
4.0	SAMPLE EQUIPMENT ASSEMBLY	4-1
5.0	ELEMENTS OF FIELD SAMPLING	5-1
6.0	FIELD DOCUMENTATION	6-1
7.0	SAMPLE LABELING, PACKAGING, AND SHIPPING	7-1
8.0	SAMPLE SHIPMENT LOGISTICS	8-1
9.0	EQUIPMENT CLEANING AND RETURN PROCEDURES	9-1
10.0	SAFETY CONSIDERATIONS	10-1
11.0	DATA ACCESS	11-1
12.0	LEGAL CONSIDERATIONS	12-1
13.0	LABORATORY CONSIDERATIONS	13-1

1.0 INTRODUCTION

For a variety of reasons, field sampling has become more complicated both technically and administratively. Uniform procedures for field sampling activities are needed to:

- Provide data of known quality for making environmental decisions or taking enforcement action,
- Make efficient use of the available laboratory capacity,
- Reduce problems created by improper sample handling procedures.

The Region 10 Field Sampler Training Course is intended to aquaint EPA samplers with the important elements for successful field sampling. This course emphasizes the general procedural aspects of sampling common to all programs administered by EPA. Other training references must be consulted for specific sampling techniques and statistical sample plan design.

The information provided in the Field Sampler Training Course is part of a larger training program for EPA field inspectors covering administrative, technical, legal and communications aspects of field sampling, inspection and compliance activities. The modules of the Inspector Training Program that are included in this Field Sampler Training Course are highlighted in Figure 1.1. EPA samplers may also want to participate in other elements of the Inspector Training Program.

The material is presented in the logical sequence of a typical sampling exercise as shown in the table of contents. The course is intended to present the proper procedures and to explain the reasons for the procedures. The manual can be used as a reference to remind you of the critical elements of a field sampling project. It is not, however, intended to be a comprehensive treatise on field sampling.

Each section of the manual is numbered and dated. Revised sections will be distributed when any significant change is made. If at any time you have questions related to proper sampling procedures, please contact the appropriate person listed by each topic on the agenda on the Chief of the Field Operations and Technical Support Branch, Environmental Services Division.

Basic Training Program
for Region 10 Compliance Inspectors

Training for Inspectors

	Laboratory/Field Data Access	Confidential Business Information	
Finance Considerations	Basic Photography	Overview of Environmental Statues	
Time Accounting Considerations	Laboratory Considerations	Criminal vs. Civil Investigations	
Field Equipment And Supplies	Sample Management	Case Development Procedures	Technical Report Writing
Safety Policy/Admin. Procedures	Project Plan Development	Entry Protocol	Relationship Between EPA & State/ Local Inspectors
Employee Conduct	Safety Training	Witness Guidelines	Dealing with the Media & Public
Administration	***Technical***	***Legal***	***Communication***

Figure 1.1

What Is Quality Assurance ?

The Environmental Protection Agency is a regulatory agency, an enforcement predicated organization, and as such, all data generated or used by EPA must be of known, defensible, and verifiable documented quality. This is a matter of agency policy, as expressed in EPA Order 5360.1, and as such should be viewed as an integral requirement of all data gathering activities.

We're all familiar with QC; it is (or should be) a normal part of good field and laboratory practice. It is the "built ins" included in methods to be sure we're getting the data we want. QC includes all of the procedures applied to data collection and generation activities in order to achieve and maintain a desired level of data quality as established by Agency and Program Managers. The desired level of data quality should be based on the intended use of the data. Therefore the QC should include all of the technical controls utilized, i.e. sampling and analytical methods, use of blanks, replicate and duplicate samples, inclusion of performance or standard samples, standard curves and statistics, etc. The controls start with the design of the data acquisition project and carry through to the ultimate data reporting and completion of all of the documentation of the use of these controls.

QA, on the other hand, refers to the procedures used by the management to assure that the QC is what is required and that it is being adhered to at any point on the project. QA constitutes the overview and monitoring processes designed to be sure that the quality of the data generated meets the desired levels as established by the management. These controls include establishing data quality objectives based on the intended use of the data, the institution of procedures for formalizing planning documents prior to the initiation of data collection activities, and the use of audits to identify problems in QC.

The headquarters Quality Assurance Management Staff (QAMS) and the Regional Quality Assurance Management Office (RQAMO) has been working with individual program managers, field specialists, and the Office of Regional Counsel to develop program specific QA guidance materials. These are intended to aid the regional monitoring programs in developing their site specific Quality Assurance Project Plans (QAPs).

We hope to reduce the paperwork, but we also want to make sure that the whole program team is involved and understands why they are doing what they are doing when monitoring and gathering environmental data. We feel that resource expenditure for sound QA at the front end of a project will more than pay for time and resources utilized at the end. As professionals, we cannot condone never having enough time to do a job right, but always having enough time to do it over. With this philosophy in mind, let's review the QA program required elements, and illustrate them with some of the RQAMO's guidance material.

The Region 10 Format addresses the following elements:

- Project Description and Site Location: This element documents the WHAT, WHERE and part of the WHY of the project being conducted. This will include some of the history and the justification for the project and deals with the physical aspects defining the project area, space, and environmental concerns requiring the generation of data.

- Project Measurement Objectives: Here we "zero in" on the information we need as professionals to meet the requirements of the project. These may be clearly defined by regulatory specification, or may be based on enforcement needs requiring investigative procedures developed scientifically to address one particular site or type of problem. Ideally, this is a joint decision of both the field investigator and the project manager if they are different individuals.

- Sample Rationale and Network Design: This is the description of HOW you decided to take the samples or measurements WHERE you are going to take them. Such decisions (rationale) are site related, but the mechanisms of selecting the actual sample points (network) is a mixture applied statistics, regulatory requirement, enforcement needs and, most important, COMMON SENSE.

- Analyses Rationale: This is presented as a matrix to help the preparer(s) of the QAP document the regulatory required information relevant to analytical methods. Remember, the analyses of a sample really starts with the designation and preparation of the sample container, and the statistical evaluation of some elements of quality are time and consistency dependent, hence the holding time and preservation factors. This section starts the real "paper trail" which we hope will make clear to the planners and anyone later in the process the physical accountability of the project. Here, for the first time in the process, some of the field QC samples normally used are designated as QA samples, and so listed.

- Data Quality Objectives: Actually, the majority of these elements we are discussing are Data Quality Objectives; by breaking them down into discrete steps we can avoid overlooking any of them. This particular section is another matrix essential to the QA process, but also helpful to the planners and their successors. They list what elements, compounds, classes of compounds, and/or physical data required for the needs of the project. Tied to this is listed the method the planners have chosen (usually from experience, consultation with the laboratory, or because of regulatory requirement) to best generate the type of data desired and help ensure data comparability. The method listed usually spells out the Detection Limit, and should help define the Precision and Accuracy for the total measurment system or at least for the analyses specified. The Completeness information lets the planner define the actual amount of the data generated, and be certain that sufficient data is acquired to satisfy the plan and its validity.

- This completeness information provides a built in control to be sure that the actual samples taken are analyzed and reported, or that their loss results in a corrective action. All of the DQO's are used to be sure the data is representitive of the conditions on site, and results should be expressed in terms or units comparable with previously collected data.

- Sample Procedures to be used: This section keys the planner and the sampler to a clearer agreement of the positions stated in the Project Measurement Objectives and the Sample Rationale and Network Derivation sections. It should provide a meeting ground for professional understanding of both technical and management special considerations. It should provide any reviewer at any point in time basic information about the physical acquisition of the samples.

- Sample Custody and Documentation: This is the very core of the "paper trail". At the minimum, this section should meet the recording and documentation requirements authorizing the specific project. This does not mean we do not perform the most conscientious and professional job we can on a given project, but that we also have to assume additional duties to document what we have done. Hopefully, this QA planning format will make this easier.

  One very important point to remember about the Sample Documentation and Chain of Custody requirements of the QA planning process: They are designed to protect you as a potential witness, and your credibility as a professional. If this is accomplished, then the credibility and litigational position of the agency is greatly strengthened. It could be three years or more for some litigational processes to pass before you might be called as a witness. You will need every document you can get your hands on to refresh your memory or establish that you acted in a professional manner, according to the normal conduct of your business.

- Calibration Procedures and Frequency: This element deals primarily with physical measurements in the field and the laboratory. It may be dealt with best by encouraging the use of Standard Operating Procedures (SOP), (as is done in the Laboratory) in the field. Such an SOP would define calibration and standardization procedures, required frequency, and operational checks (zero and span adjusments) etc. It is also the place to list acceptable deviations, or cite alternate approved methods. Field expedients are acceptable, provided they do not compromise data required by a regulation, are technically sound, and are completely documented.

- Preventative Maintenance: Really an extension of above, but more concerned with the instruments used and documenting their consistent condition. This section could best be satisfied if both Lab and Field Instruments were covered in an SOP listing manufacturer's operational and maintenance recommendations.

- Laboratory Data Reduction/QA Review: In this section, the planner of the project can designate what degree of QA effort each involved element of a project would require. Normally, the Laboratory QA review will classify the laboratory data by evaluating the QC/QA sample results for checking the Precision, Accuracy, Completeness and other objectives defined by the QAP or other supporting or cited QA documents.

- Field Data Reduction/QA Review: In this section, the planner and the field technical professionals should detail the degree of operational procedures to be used on physical measurements taken in the field. Use of blank, duplicate,or check samples, sampler/recorder to verify each other's observations, retention of read-out or analog charts, photographs, self-check by entering observations (where applicable) on both the Field Data Sheet and in a Field Log or Notebook, all are examples of the type of information required here.

- System and Performance Audits: In this section, the project planners or their management may request or specify a variety of audits. The QAO can supply standard QC materials for project specific performanc evaluation (PE) type audits, and can conduct in depth Management System Audits (MSA), Technical System Audits (TSA) and Document System Audits (DSA) at either the field, laboratory or office level. Alternately, an audit may be scheduled by the RQAMO, ESD peer review, or externally by ORC, NEIC, EMSL, etc.

- QA Report to Management: Normally, RQAMO will review data packages in cooperation with laboratory staff, or project managers. Any audit performed will result in a complete report to the appropriate management, and in the event of a corrective action being required, will result in additional documentation of the solution sought and reached or action taken.

- Corrective Action: This is the element which allows a great degree of flexibility in meeting QA/QC requirements when actually conducting field operations in the real world. If, in your professional opinion, you cannot perform the field operation as described in this plan, even through no fault of your own, you can exercise your training, ability, and professional innovateivness to generate the data required. If an auditor sees a need for a different approach, if another investigator sees a related problem not addressed in the plan, if a legal point arises, you can add or subtract samples or other activities, provided you document your changes and reasons for the actions on a form, such as that appended to our model QAP. You will have to justify why, after the fact, but if you had sufficient cause to deviate from the plan, you should have no problem with use of a the Corrective Action Checklist.

Sample Alterations: The same philosophy applies to use of this Checklist, but is aimed more at the actual measuring or analyzing protocols used both in the field and in the Laboratory. They are both verifiable points on the paper trail, supplying defensible reasons for deviating from a plan, and tracking changes in the amount of data generated for a specific plan.

- Safety: This is technically a part of the QA plan, but this section can be used to cite Regional or Agency plans acceptable to the Regional Safety Officer. Any deviation from accepted Regional or Agency Safety Protocols must be defined in a separate Site or Project Safety Plan approved by the Regional Safety Officer.

Again, the RQAMO, in cooperation with program staff personnel, have developed comprehensive guidance packages for meeting the QA requirements of specific programs. I would stress the fact that these are Program specific GUIDANCE, and as such contain a variety of material, not all of which would be applicable to one particular site specific Quality Assurance Plan. Remember, the desired level of data quality should be based on the intended use of the data. The planner can extract from the guidance that level of QA dictated by the needs of the specific project. The RQAMO would like to see the Project Officers develop their site specific QA Plans, and will cooperate and assist in the development of Standard Operating Procedures (SOP) for specific operations like NPDES, PCB Inspections, etc..

We have included in the packages a suggested format for individual QAP's, which also serves as a tracking/scheduling document for the sampling and analysis phases of an investigation or inspection. We would appreciate, for the purposes of reviewing and assisting the preparers of QAP's, that the order of information follow the outline of this format, and include the first page containing the sign-off information critical to the scheduling.

QUALITY ASSURANCE PROJECT PLAN

Project Name: ____________________

Project Manager: ____________________

Field Operations: ____________________

QA Office Concurrence: ____________ Date: ____________

ESD Peer Review: ____________ Date: ____________

Project No.: ____________ Account No.: ____________

Laboratory Designated: ________ EPA ________ CLP ________ Private

Sample Numbers assigned: from ____________ to ____________

Sample Schedule and Milestones:

Activity/Date: / / / / / / / / /

/

/

/

/

/

/

Reports required:

/

Sample Management Contrpl Center ____________
Date: ____________

Project Description and Site Location:

Project Measurement Objectives (Intended use of data):

Sample rationale and network derivation:

(2-6)5/86

Analyses Rationale:

# of Samples	Parameter	QA Samples	Matrix	Container	Holding Time	Preservation

Data Quality Objectives:

Parameter	Method #	Detection Limits	Precision	Accuracy	Completeness

Sample procedures to be used:

Sample Custody and Documentation:

Calibration Procedures and Frequency:

Preventative Maintenance:

If, for any reason, the schedules or procedures above cannot be followed, the appropriate person must complete a "Sample Alteration Checklist" for each element changed and have it (them) verified and reviewed by the Project Manager and the QA Officer/Peer Review. (See page 5)

Laboratory Data Reduction / QA Review:

Field Data Reduction/QA Review:

Reports (as deliverable or required):

System and Performance Audits:

Scheduled: ____________________ Conducted: ____________________

Corrective Action: (IF YES, COMPLETE CORRECTIVE ACTION CHECKLIST AND/OR SAMPLE ALTERATION FORMS, Appendix B.)

QA Report to Management:

Safety:

SAMPLE ALTERATION CHECKLIST

Project Name and Number:

Material to be sampled:

Measurement Parameter:

Standard Procedure for Field collection & Laboratory Analysis (cite references):

Reason for change in Field Procedure or Analytical Variation:

Variation from Field or Analytical Procedure:

Special Equipment, Materials, or Personnel Required:

Initiators Name: ______________ Date: ______________

Project Approval: ______________ Date: ______________

Laboratory Approval: ______________ Date: ______________

QA Officer/Reviewer: ______________ Date: ______________

Sample Control Center: ______________ Date: ______________

CORRECTIVE ACTION CHECKLIST

Project Name and Number: ______________________________

Sample Dates Involved: ______________________________

Measurement Parameter(s): ______________________________

Acceptable Data Range: ______________________________

Problem Areas Requiring Corrective Action: ______________________________

Measures Required to Correct Problems: ______________________________

Means of Detecting Problems and Verifying Correction: ______________________________

Initiators Name: ____________ Date: ____________

Project Approval: ____________ Date: ____________

Laboratory Approval: ____________ Date: ____________

QA Officer/Reviewer: ____________ Date: ____________

Sample Control Center: ____________ Date: ____________

3.0 REGIONAL SAMPLE CONTROL CENTER

3.1 Introduction
3.2 Major Responsibilities
3.3 Procedures for reserving laboratory space
3.4 Priorization of samples at the EPA Laboratory
3.5 Obtaining a project code, lab numbers and lab space
3.6 After samples are shipped / Calling in shipping information
3.7 Hard data

REGIONAL SAMPLE CONTROL CENTER

3.1 Introduction

The Regional Sample Control Center (RSCC) is located in the Field Operations and Technical Support Branch of the Environmental Services Division. The basic objectives of the RSCC are to:

- maximize the utility of Regional Laboratory support resources including the EPA Lab and the National Contract Laboratory Programs, and
- provide timely and accurate Laboratory support to all regional environmental programs.

3.2 Major Responsibilities

The RSCC's major responsibilities include:

- Ensuring that Regional administrative procedures (i.e., an approved QA plan prior to sampling) are adhered to.
- Providing to Headquarters sample demand estimates and updates for the Superfund and RCRA programs.
- Coordinating and tracking the Quality Assurance review of Contract Laboratory data.
- Gathering sampling projections for the EPA Lab from all Programs.
- Reserving lab space and making Lab arrangements for the analysis of samples at the EPA lab and contract labs.
- Providing sample priority information to the Manchester lab.
- Coordinating the entry of contract lab data with the Manchester Lab.
- Assisting the Quality Assurance Office in performing QA audits.
- Providing data (several outputs are available) to Project Officers.

3.3 Procedure For Reserving Laboratory Space

- Each month Programs and Operations Offices are asked, by the the RSCC, for their Laboratory support needs for the coming month.

- Superfund requests for Laboratory support should be given to the RSCC as soon as possible. Routine contract lab work is scheduled the Tuesday before the week of sampling. Special Analytical Services requests require 2-3 weeks advance notice.

- Programs are encouraged to give the RSCC as much advance notice as possible for longer range lab needs.

- The RSCC maintains a master, long range calendar of upcoming laboratory support necessary. Last minute, non-emergency requests for lab support will be honored to the extent possible.

- If analyses of special or non-routine parameters are to be performed by the EPA Lab or the CLP this information should be given to the RSCC as soon as possible for scheduling and coordination with the EPA Lab or the Sample Management Office.

- Project Officers should inform the RSCC of any changes in the sampling plans (i.e., sampling is delayed) and why immediately. Contract lab space must be cancelled or rescheduled as soon as possible once the plans have changed. Headquarters also tracks closely the Region's useage of the CLP.

3.4 Priorization of samples at the EPA, Manchester Lab

A request for sample priorization is sent out by the RSCC to the Program Section Chiefs twice a month. The Program is asked to prioritize their projects or indicate if there are any samples which require a high priority. High priority samples are usually those where there is a public health threat or the data is needed quickly for an enforcement or legal action. The maximum recommended sample holding time for the scheduled analyses is also a factor which the Lab will consider. If no priority information is received samples are analyzed on a first-in-first-out basis. The goal is to have a 30-45 day turnaround on all samples, however, the turnaround time may increase when the Lab is performing more complicated or non-routine analyses.

Project Officers should inform the RSCC of samples which will be high priority in advance (before the samples are collected). The RSCC may ask the Project Officer to consider rescheduling if a quick turnaround is not possible due to a large Lab Backlog or other samples requiring a quick turnaround. All efforts will be made to respond to the Program's needs. Contact the RSCC to change the priority of samples between sample priorization request periods.

3.5 Obtaining a Project code, lab numbers and lab space

Before laboratory space is provided an approved Quality Assurance plan or, in the case of a TSCA inspection, a PCB inspection plan, must be provided to the RSCC. However, as soon as a Project Officer knows of upcoming sampling the RSCC should be informed. This early notification is necessary so that lab space can be reserved.

Once the QA plan is approved and a Lab is assigned the applicable codes will be issued to the Project Officer. Necessary paperwork for field documentation can also be obtained through the RSCC.

3.6 After samples are shipped

After the samples are shipped to the Manchester lab, the lab should be called with the number of samples shipped and the expected arrival date. If the Lab cannot be reached call the RSCC. On samples going to a contract lab, either the RSCC or the Sample Management Office should be called with the shipping information (i.e., airbill number, number and matrix of samples, and receiving Lab).

3.7 Hard Data

Once all analyses are completed by the EPA lab the data is sent automatically by the RSCC to the designated Project Officer. If partial data retrievals are desired the Project Officer can inform the RSCC of this at the time the Lab is assigned.

Contract Lab data is now being entered into the Laboratory Management System; the main database for analytical results. After the data packages are quality assured and the data stored and verified in the database; computerized outputs will be sent to the Project Officers. The entering of CLP data is still a relatively new procedure. Initially, Project Officers may still receive some data in memo form.

4.0 Sample Equipment Assembly

4.1 Equipment and Supply Requisition

a. Complete Field Supply List (see page 4-2) and submit it to Andy Hess to request field supplies, sampling containers, blank water and safety gear.
b. Attached is a copy of the Field Supply List with the recommended sample containers for the Manchester Lab listed on the back.
c. Refer to the Equipment Tracking System catalog (available from John Osborn, Rene Fuentes, Paul Boys, Billie Lee, Dave Turpening, Bob Burd, and Dave Bueker) for lists of available supplies and equipment.
d. Allow adequate time for preparation and shipment.

4.2 Sample of Equipment and Supplies Available

Air Equipment
- Air pumps
- Air sample bags
- Wind system recorder
- Flow meter
- Temperature meter
- Thermal desorber

Biological Equip.
- Fish shocker
- Benthic samplers
- Plankton samplers
- Benthic respirometer
- Van Dorn samplers
- Kemmers
- Live fish holders

Clothes
- Rubber boots
- Chest waiders
- Hip waiders
- Rain gear
- Gloves-neoprene, & disposable
- Cotton coveralls
- Disposable tyvek coveralls
- Boot covers
- Hardhats

Communication
- 2-way radios
- Remic headsets
- Megaphone
- Air horn

Vehicles & Boats
- 4x4 Van & Truck
- Van with raised roof
- 16' Boston Whaler
- 24' Monark with winch
- 17' Smokercraft
- Electroshocking boat

Soil Sample Equip.
- Hand auger
- Mobile drills
- Dredges
- Coring devices
- Shovels, etc.
- Disposable wood tongue depressors
- Sieves
- Stainless spatulas
- Piston corer

Ground Water Equip.
- Water level indicator
- Bailers
- Electrical logger
- Resistivity meter
- Gamma-ray logger
- Well point sampler
- Hydrolab (4" diam.)
- Hydrologic monitor
- Proton magnetometer
- Submersible pump
- Peristoltic pump

Miscellaneous
- Survey equipment
- Rangefinder
- Camping gear
- Buckets
- Carboys
- Fire extinguisher
- Fence posts
- Generator
- Multimeter
- Power inverter
- Rain gauges
- Tools
- Metal Detector
- Steam cleaner
- Flashlights
- Chart recorder

Hazardous/Safety Equip.
- Combustable gas & oxygen alarm
- Combustable gas indicator
- Draeger detector & tubes
- Dosimeter
- Encapsulated suits
- Respirators & cartridges
- Escape masks
- Explosimeter
- Eye and face wash
- First aid kit
- HNu photoionizer
- SCBA's & air cylinders
- Organic Vapor Analyzer
- Radiation detector
- Resuscitator
- Sound level meter

Surface Water Equip.
- Alpha sampling bottles
- Current meters
- Suspended Sed. samples
- Chlorine test kit
- Conductivity meter
- Depth finder
- DO meter
- pH meters
- Dye, florescent
- ISCO sampers
- Manning flowmeters
- Hydrolabs
- Horiba Water tester
- Imhoff cones
- Salinometer
- Sechi discs
- Tele-thermometer
- Thermographs
- Thermometers
- Turbidimeter
- Drum thieves

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 10 - Seattle

FIELD SUPPLY LIST

Forms

____ Field Sample Data & Chain of Custody Sheet
____ Custody Tape
____ Chain of Custody Sheet

Analysis Required Sheets

____ Priority Pollutants - Organics
____ Physical & General Inorganics & Ion Chromatograph
____ Oxygen Demand, Solids & Nutrients
____ Metals

Containers

Glass Jars				Cubitainers	
____ 1 gal	____ C-Free	____ 8 oz.	____ C-Free	____ 1 qt(1L)	____ Deion/Dist
____ 1/2 gal	____ C-Free	____ 4 oz.	____ C-Free	____ 1 gal	____ Deion/Dist
____ 32 oz.	____ C-Free	____ 120ml vial	____ C-Free	____ 2+ gal	____ Deion/Dist
____ 16 oz.	____ C-Free	____ 40ml VOA	____ C-Free	____ other ________________	

General Supplies

____ Sample Labels
____ Label Tape
____ Lab Markers
____ Strapping Tape
____ Shipping Labels
____ Roll Paper Towels/Kimwipes
____ Plastic Bags, size______
____ Tags & Rubber Bands
____ Rite-in-the-Rain Notebook
____ Empty Ice Chests
____ Duct Tape
____ Flashlight
____ Measuring Tape
____ Detergent
____ Washwater
other____

Protective Clothing and Gear

____ Neoprene Gloves, size_____
____ Disposable Vinyl Gloves, size_____
____ Boot covers, size_____
____ Rubber boots (steel toe), size _____
____ Rain gear, size___________:
  ____ Jacket, ____ Pants, ____ Overalls
____ Tyvek Coveralls, size_____
____ Hard Hat
____ Goggles/Face Shield
____ Respirator cartridge/canister: specify type________________
____ Cotton Coveralls, size_______
____ Waiders,Hip/Chest, size_______
____ First Aid Kit
other____

Sample Collection Gear

Sediment

____ Disposable wood spatulas
____ Hand Trowel/Shovel
____ Hand Coring Device
____ Hand Auger
____ Dredge
____ Power Drilling Rig
other________________________

Water/Liquid

____ Automatic Water Sampler (ISCO)
____ Peristaltic Pump
____ Bailer
____ Van Dorn/Kemmer Bottle
____ Drum Thief
____ Bucket/Scoop with long handle
other______________________________

Meters/Detectors

____ pH; ____ Conductivity; ____ DO; ____ Temperature; ____ Turbidity; ____ Multiparameter
____ HNU, ____ 10.2ev., ____ 11.7ev.; ____ OVA; ____ CGI/Oxygen; ____ Current
____ pH paper; ____ Thermometer,°C/°F; Detector Tubes, specify_____________________
other____

Requestor:______________________________ Phone:______________ Date Required:__________
Sample Location:______________________________________ Account Number:____________________
eturn to Andy Hess, M/S LAB, 442-0370

OTHER ITEMS AND ACCOUNTABLE ITEMS WITH EPA DECAL NUMBERS:

Sample volumes and containers required by the EPA Manchester Lab for certain analyses are shown below. This information is intended as a guide only. It is recommended that the Laboratory be contacted when determining the proper sample containers.

Parameter and Matrix	Size and Type of Container
Base/Neutral/Acid - Water	1 gallon glass
Pesticides - Water	1/2 gallon glass (wide mouth)
Base/Neutral/Acid/Pesticides - Sediment	8 ounce glass
Volatile Organics - Water	2 40 ml glass vials
Volatile Organics - Sediment	8 ounce glass
PCB - Oil	16 or 40 ml glass vial
PCB - Water	1/2 gallon glass
PCB - Sediment	8 ounce glass
Herbicides - Water	1/2 gallon glass
Herbicides - Sediment	8 ounce glass
Oil and Grease - Water	1/2 gallon glass
Oil and Grease - Sediment	8 ounce glass
Cyanide - Water	1 quart cubitainer
Phenols - Water	1 quart glass
Metals - Water	1 quart cubitainer
Cyanide/Phenols/Metals - Sediment	8 ounce glass
Total Organic Halides (TOX) - Water	1 quart glass
Total Organic Carbon (TOC) - Water	1 quart cubicainer
Ignitability - Liquid (60 mls required)	4 or 8 ounce glass
Biological Oxygen Demand (BOD) - Water	1 gallon cubitainer

5.0 ELEMENTS OF FIELD SAMPLING

This course is not intended to go into any significant detail on the technical procedures for sampling. Each program has reference manuals or guidance documents which provide this type of information. In this section only a brief listing of some of the general sampling considerations will be mentioned. The point is to stimulate the sampler/project officer to give sufficient thought to the particular sampling techniques that may be needed for the planned project. Several sampling considerations which need to be included in the planning are listed below.

5.1 REPRESENTATIVENESS

- Space and time
- Grab or composite
- What will the sample result be compared with or used for

5.2 CONTAMINATION

- Take care not to cross-contaminate samples
- Use disposable sampling utensils whenever possible
- Pre-rinse cubitainers with the water from the sample source, if appropriate

5.3 IN-SITU MEASUREMENTS

- Insure proper calibration of the instrument prior to performing the measurement (and afterwards, if appropriate)
- Record the instrument range/span/or gain settings used at the time of measurement

5.4 VOLUME OF SAMPLE COLLECTED

- Consider the amount needed to perform the requested analyses (see page 4-3), but remember that the lab prefers not to have much residual sample volume for hazardous waste samples (ie. soil analysis requires about 6 ounces)
- VOA, O_2, pH, CO_2, H_2S, NH_3, free chlorine, SO_2, and hardness samples must completely fill the container
- Allow 10% ullage for all other samples or overpack into a larger container

5.5 SAMPLE COLLECTION DEVICES/TECHNIQUES

- Refer to the ESD Equipment Tracking System listing for available sampling equipment (or call Andy Hess at 2-0370)
- Go prepared for several alternative sampling approaches
- Refer to program specific sampling manuals and guidance manuals

6.0 FIELD DOCUMENTATION

FIELD SAMPLE DATA AND CHAIN OF CUSTODY SHEET (FSDCOCS)

1	Project Code & Account No	Obtain from Joyce Crosson 442-8562
2	Name / Location	As appropriate.
3	Project Officer	Name of person who should receive lab data. Usually person collecting samples.
4		Check appropriate box
5	Notes	Use for comments.
6	Samplers	List names
7	Recorder	Signature of person completing the FSDCOCS
8	Examples	
	Source Code	See Back of FSDCOCS
	Matrix	As appropriate
	Number of Containers	Enter number
	Lab Number	Obtain from Joyce Crosson before sampling Note 4 digit sequence number
	Station Number	STORET station number (If available)
	Date/Time	Military time For composite samples -- beginning date/time of first aliquot
	Ending Date/Time	Date/Time of last aliquot
	Type	See back of FSDCOCS T - Time Aliquots taken at set frequency S - Space -- Grabs over an area F - Flow -- Variable time intervals B - S&T
	Frequency	See back of FSDCOCS
	Station Description	Be specific
9	Codes	See back of FSDCOCS
10	CHAIN OF CUSTODY	Document POSSESSION of samples en route to Region 10 laboratory. If sent to another lab via common carrier, sign in "DISPATCHED BY" box.

(In many cases, samples are brought to the Region 10 office and picked up by someone for delivery to lab. In this case, the intermediate person should sign in "RECEIVED BY" box and also when RELINQUISHING the sample to the lab or when samples are DISPATCHED via common carrier to some other laboratory.)

EPA
EPA Region 10
1200 Sixth Avenue
Seattle WA 98101

FIELD SAMPLE DATA AND CHAIN OF CUSTODY SHEET

① Project Code: TEC-094 A Account: TFA 10 PC
② Name/Location: ABC Inc, SEATTLE
③ Project Officer: JON DOUGH

④
☐ Enforcement/Custody
☐ Possible Toxic/Hazardous
☐ Data Confidential
☐ Data for Storet

Notes: ⑤
CASE No: 1057
SAS No: 1234 J

⑥ Samplers: JON DOUGH
Second Sampletaker

⑦ Recorder: Jon Dough (Signature Required)

⑧

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			LAB NUMBER			STATION NUMBER	DATE				COMPOSITE ONLY					STATION DESCRIPTION
																ENDING DATE					
	Water	Sediment	Tissue	Oil	Unpress	H_2SO_4	HNO_3	Yr	Wk	Seq		Yr	Mo	Dy	Time	Mo	Dy	Time	Type	Freq	
	X				3	1		84	49	5150		84	12	07	0915						FIELD TRANSFER BLANK - ABC Inc
34	X				3	1	1	84	49	5151	J1596	84	12	07	0930						ABC Inc Secondary Effluent —MJ0911
49		X			1			84	49	5152	DG004601	84	12	07	1000						ABC Inc - Soil Next to #5 Tank Outlet Valve
34	X				3	1		84	49	5153		84	12	07	1015	12	08	0915	T	24	ABC Inc - Secondary Effluent
71			X		1			84	49	5170		84	12	07	1315						ENGLISH SOLE - EAGLE HARBOR #12A
42		X			1			84	49	5171		84	12	07	1400						Eagle Harbor #37

⑨

LAB NUMBER			DEPTH	Units	Type	COL MTD CD	QA CODE	TEMP DEG C	pH	CNDCTVTY umho/cm	MISCELLANEOUS
Yr	Wk	Seq									
84	49	5150					FXFR				
84	49	5151				21		26	7.2		90° V Notch 8" Head
84	49	5152				10					Top 6" of soil
84	49	5153				21		20	7.4		

└see back of Sheet

CHAIN OF CUSTODY RECORD ⑩

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)		DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)		DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)		DATE/TIME
RELINQUISHED BY: (Signature) Jon Dough	REC'V'D BY MOBILE LAB FOR FIELD ANAL.: (Signature)		DATE/TIME
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) Steve Analyst	DATE/TIME 12/7/84 1700
METHOD OF SHIPMENT Hand Carried			

Laboratory Copy White
Project Officer Copy Yellow
Field or Office Copy Pink

GPO 593 456 / 20000

ANALYSIS REQUEST SHEETS

These forms must be used when submitting samples to the EPA Laboratory. Analysis request sheets are available from Joyce Crosson or the laboratory.

Examples are shown for the available Analysis Request Sheets.

1	Project Name	Enter Project Name
2	Project Code	Enter Code
3	Account Code	Enter Code
4	Sample Numbers	Enter 8 digit EPA lab number
5	Matrix Codes	Circle as appropriate

EPA Region 10 Laboratory **Analyses Required**

PHYSICAL & GENERAL INORGANICS AND ION CHROMATOGRAPH

① ② ③

Project Name: ABC Inc.
Project Code: TEC-094A
Account Code: TFA 10PC

⑤ **Matrix Codes** *(circle one only)*
[✓ 10] Water-Total
11 Water-Dissolved
40 Sediment/Soil
45 Semi-Solid/Sludge
46 Sediment for EP Toxicity
70 Tissue
80 Oil/Solvent
00 Other

④

		Sample Numbers																		
		84495151	84495153																	Analy/Comp Init/Date
Physical & General Inorganics *WG (10)*																				
Turbidity	TURB																			
pH (Lab)	pH	X	X																	
Conductivity	COND																			
Total Alkalinity	T ALK																			
Total Hardness	T HARD																			
Bicarbonate	HCO3																			
Calcium	Ca																			
Carbonate	CO3																			
Chloride	Cl																			
Fluoride	F																			
Sulfate	SO4-TOT																			
Sulfide	S																			
Cyanide	CN																			
Acidity	Acidity																			
Hardness	CaCO3																			
Color	Color																			
Ion Chromatograph *WG (80)*																				
Calcium	Ca																			
Chloride	Cl																			
Cyanide	CN																			
Fluoride	F																			
Magnesium	Mg																			
Potassium	K																			
Sodium	Na																			
Sulfate	SO4																			
Nitrate	NO3																			
Nitrite	NO2																			
Ortho Phosphorous	O-Phos.																			

Save samples after analysis? **NONE, SOME** or **ALL.** *(If SOME, circle sample numbers.)*

Special detection limits and comments: ______________________

Project Officer Signature *Date*

EPA Region 10 Laboratory

Analyses Required

OXYGEN DEMAND, SOLIDS AND NUTRIENTS

Project Name: ABC Inc

Project Code: TEC-094A

Account Code: TFA 10 PC

Matrix Codes *(circle one only)*

- [✓ 10 Water-Total]
- 11 Water-Dissolved
- 40 Sediment/Soil
- 45 Semi-Solid/Sludge
- 46 Sediment for EP Toxicity
- 70 Tissue
- 80 Oil/Solvent
- 00 Other

		Sample Numbers																		Analy/Comp Init/Date
		84495151	84495153																	
Oxygen Demand & Carbon *WG (18)*																				
Bio. Oxygen Demand	BOD/5 day	X	X																	
Bio. Oxygen Demand	BOD/20 day																			
Bio. Oxygen Demand	BOD/60 day																			
Bio. Oxygen Demand (5-day) Carbonaceous	BOD/5 day-C																			
Chem. Oxygen Demand	COD																			
Total Organic Carbon	TOC																			
Solids *WG (15)*																				
Total Dissolved	TDS																			
Total Sus. Solids	SS	X	X																	
Total Solids	TS																			
Volatile	TVS																			
Volatile Suspended	TVSS																			
Settleable Solids	SetSlds																			
% Total Solids	% Tot																			
% Volatile Solids	% V Slds																			
Grain Size	Grn Siz																			
Nutrients *WG (20)*																				
Ammonia	NH3																			
*Nitrate	NO3																			
*Nitrite	NO2																			
Nitrate + Nitrite	NO3 + NO2																			
Kjeldahl	Kjel-N																			
Total Phosphorous	T-Phos																			
Dissolved Phosphorous	D-Phos																			
*Ortho Phosphorous	O-Phos	X	X																	
Dissolved Orth. Phos.	D-O Phos																			

** Parameters may also be analyzed via the Ion Chromatograph workgroup methodology.*

Save samples after analysis? **NONE, SOME** or **ALL.** *(If SOME, circle sample numbers.)*

Special detection limits and comments: ______________________

Project Officer Signature ______________________ *Date*

EPA Region 10 Laboratory

Analyses Required

METALS

Project Name: ABC INC Project Code: TEC-094A Account Code: TFA 10PC

Matrix Codes *(circle one only)*

[✓ 10 Water-Total]
11 Water-Dissolved
40 Sediment/Soil
45 Semi-Solid/Sludge
46 Sediment for EP Toxicity
70 Tissue
80 Oil/Solvent
00 Other

Metals *(circle WG #)*
Workgroup [✓ 30] Standard Method
Workgroup 34 - EP Toxicity Method

		Sample Numbers																		
		84495151	84495153																	Analy/Comp Init/Date
Aluminum	Al	X																		
Antimony	Sb	X																		
Arsenic	As	X																		
Barium	Ba		X																	
Beryllium	Be																			
Boron	B																			
Cadmium	Cd	X																		
Calcium	Ca																			
Chromium	Cr	X																		
Chromium Hexavalent	Cr+6		X																	
Cobalt	Co																			
Copper	Cu	X																		
Iron	Fe																			
Lead	Pb	X																		
Magnesium	Mg																			
Manganese	Mn		X																	
Mercury	Hg	X																		
Molybdenum	Mo																			
Nickel	Ni	X																		
Potassium	K																			
Selenium	Se																			
Silver	Ag	X	X																	
Silicon	Si																			
Sodium	Na																			
Thallium	Tl																			
Vanadium	V																			
Zinc	Zn	X	X																	

Save samples after analysis? **NONE, SOME** or **ALL.** *(If SOME, circle sample numbers.)*

Special limits, methods and comments:

Project Officer Signature *Date*

EPA X-52 Lab Copy

5/86

EPA Region 10 Laboratory **Analyses Required**

PRIORITY POLLUTANTS - ORGANICS

Project Name: ABC INC Project Code: TEL-094 A Account Code: TFA 10 PC

Matrix Codes *(circle one only)*

[✓ 10] Water-Total
11 Water-Dissolved
40 Sediment/Soil
45 Semi-Solid/Sludge
46 Sediment for EP Toxicity
70 Tissue
80 Oil/Solvent
00 Other

			Sample Numbers																		Analy/Comp Init/Date
			84495751	84495753																	
GC/MS Organic Scans																					
68	Base/Neutrals/Acids	B/N/A	X	X																	
62	Base/Neutrals Only	B/N																			
51	Volatile Organics	VOA	X	X																	
65	Acids Only	Acid																			
	Specific (GC/MS) Organics *List Below*																				
GC Organic Scans																					
71	Pesticide/PCB's	Pest/PCB	X	X																	
74	PCB's Only	PCB																			
54	Purgeable Halocarbons	Purg																			
53	Trihalomethanes	Trihal																			
73	Herbicides	Herb																			
70	Chlorinated Hydrocarbons																				
70	Organophosphate Pesticides																				
	Specific (GC) Organics *List Below*																				
Specific Organics ar Other Miscellaneous																					
67	PolyAromHydro (HPLC)	PAH																			
40	Oil Identification	Oil-Id																			
40	Phenolics (AAP)	Phenol																			
40	Oil & Grease	Oil & Greas	X	X																	
40	Flashpoint	Flashpt																			

Save samples after analysis? **NONE, SOME** or **ALL.** *(If SOME, circle sample numbers.)*

Special detection limits and comments: ________________

Project Officer Signature *Date*

INSTRUCTIONS FOR COMPLETION OF ORGANICS TRAFFIC REPORT

This form is used only when:

A. Routine Analytical Services (RAS) from a contract lab are required

B. Both RAS and Special Analytical Services are required (If only SAS are required, an SAS Packing List is used rather than an OTR.)

When OTR is completed -- KEEP PINK copy for EPA files
Send WHITE ORIGINAL to Sample Management Office
Send WHITE COPY+YELLOW to Contract Lab

1	Case Number	Enter the Case Number - usually 4-digits and/or the SAS Number - usually 4-digits followed by a "J" for Region 10.
	Sample Site Name/Code	Enter name of Facility or Project associated with samples
2	Concentration	Environmental samples usually are LOW concentration. This should be determined in advance of the sampling activity since it will affect handling and shipment.
3	Matrix	As appropriate
4	Ship To	Name of contract laboratory and contact person
5	Regional Office	10
6	Sample Type	As appropriate The peel-off labels are placed on the sample jars and lids if space allows. Place labels on jars and lids BEFORE sampling. Use the appropriate peel off labels for the sample analyses to be completed. These labels are the only identification needed on the bottles but in addition, sample tags may also be filled out and attached to the bottles if desired.
7	Shipping Information	As requested
8	Sample Description	Check as appropriate
9	Sample Location	Enter the specific sampling location
10	Special Handling	Use this area for requesting the sample analyses to be completed.

U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office
P.O. Box 818, Alexandria, Virginia 22313 – 703 557-2490 • FTS 557-2490

ORGANICS TRAFFIC REPORT

Sample Number
J 1596

① Case Number: 1057
SAS # 1234 J
Sample Site Name/Code:
ABC Inc
Seattle

② SAMPLE CONCENTRATION
(Check One)
X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)
X Water
___ Soil/Sediment

④ Ship To:
Close Enough Labs
Address
Attn: Contact Name
Transfer
Ship To:

⑤ Regional Office: 10
Sampling Personnel:
Jon Dough
(Name)
206-442-1200
(Phone)
Sampling Date:
12/7/84 0930
(Begin) (End)

⑦ Shipping Information
Federal Express
Name of Carrier
12/7/84
Date Shipped:
123456B
Airbill Number:

⑥ For each sample collected specify numb of containers used and mark volume level on each bottle.

	Number of Containers	Approxim Total Volu
Water (Extractable)	1	1 Gal
Water (VOA)	2	80 ml
Soil/Sediment		
Water (Ext/VOA)		
Other	1	.5 Gal

J 1596 • Water (Extractable)
J 1596 • Water (Extractable)
J 1596 • Water (Extractable)
J 1596 • Water (Extractable)
J 1596 • Water (VOA)
J 1596 • Water (VOA)
J 1596 • Soil/Sediment (Ext & VOA)
J 1596 • Soil/Sediment (Ext & VOA)
J 1596 • Water (Ext & VOA)
J 1596 • Water (Ext & VOA)

⑧ Sample Description
___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
X Other (specify) Effluent

⑨ Sample Location
Secondary Effluent @ V-Notch Weir

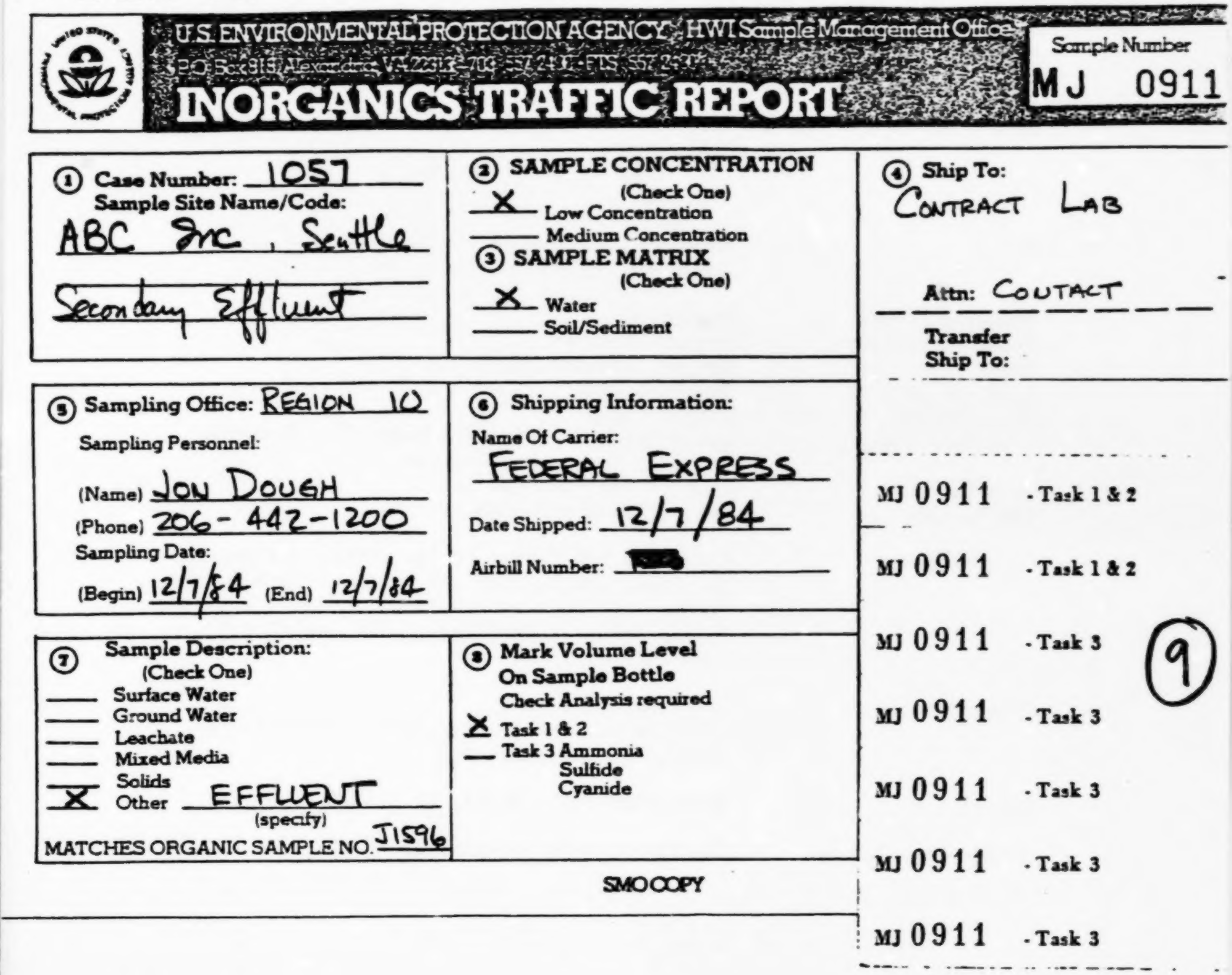
⑩ Special Handling Instructions:
(e.g., safety precautions, hazardous nature)
Analyses Required:
Base Neutrals
Acid Extractables
Pesticides
VOA

INORGANICS TRAFFIC REPORT

This form is USED when shipping samples to a CONTRACT laboratory for analysis of INORGANICS.

When completected -- Keep PINK
Send WHITE original to Sample Management Office
Send WHITE copy + YELLOW to contract lab

1	Case Number Sample Site Name/Code	Enter case Number Enter Station name/location
2	Concentration	As appropriate -- usually determined prior to sampling
3	Matrix	As appropriate
4	Ship to	Name/address of Contract lab
5	Sampling Office	As appropriate
6	Shipping Info	Usually Federal Express -- normally the airbill number is not completed since forms should be packed inside shipping containers
7	Sample description	As appropriate
8	Mark Volume level	Use grease pencil if possible
9	Peel-Off Labels	Put a peel-off label on the LID and on the BOTTLE. This is usually for Tasks 1 & 2. Bottles and lids must be dry for labels to adhere properly. If Task 3 is required, also use the Task 3 label in addition to the Task 1 & 2 label.



U.S. ENVIRONMENTAL PROTECTION AGENCY HWI Sample Management Office
P.O. Box 818, Alexandria, VA 22313 – 703/557-2490 • FTS/557-2490

INORGANICS TRAFFIC REPORT

Sample Number
MJ 0911

① Case Number: 1057
Sample Site Name/Code:
ABC Inc, Seattle
Secondary Effluent

② SAMPLE CONCENTRATION
(Check One)
X Low Concentration
___ Medium Concentration

③ SAMPLE MATRIX
(Check One)
X Water
___ Soil/Sediment

④ Ship To:
CONTRACT LAB
Attn: CONTACT
Transfer
Ship To:

⑤ Sampling Office: REGION 10
Sampling Personnel:
(Name) JON DOUGH
(Phone) 206-442-1200
Sampling Date:
(Begin) 12/7/84 (End) 12/7/84

⑥ Shipping Information:
Name Of Carrier:
FEDERAL EXPRESS
Date Shipped: 12/7/84
Airbill Number: [redacted]

⑦ Sample Description:
(Check One)
___ Surface Water
___ Ground Water
___ Leachate
___ Mixed Media
___ Solids
X Other EFFLUENT
(specify)
MATCHES ORGANIC SAMPLE NO. J1596

⑧ Mark Volume Level
On Sample Bottle
Check Analysis required
X Task 1 & 2
___ Task 3 Ammonia
Sulfide
Cyanide

SMO COPY

MJ 0911 - Task 1 & 2
MJ 0911 - Task 1 & 2
MJ 0911 - Task 3
MJ 0911 - Task 3
MJ 0911 - Task 3
MJ 0911 - Task 3
MJ 0911 - Task 3

⑨

PACKING LIST

This form is used only if:

* Special Analytical Services (SAS) are the only analytical services that have been requested. It is NOT used if Routine Analytical Services (RAS) or RAS + SAS are required.

When completed -- Keep YELLOW
Send WHITE to SMO
Send PINK + GOLD to Contract Lab

1	SAS	Enter the SAS number - obtain through Joyce Crosson
2	Sampling Office	Region 10
	Sampling Contact	Project Officer
	Phone	Project Officer phone
	Sampling Date	Sampling Date
	Date Shipped	Date Shipped
	Site Name Code	Leave blank or enter the project code number obtained from Joyce Crosson
	Ship To	Name of Contract Lab
	Lab Contact	Name of person at Lab
3	Sample Number	Enter the EPA Region 10 lab number assigned on the Field Sample Data and Chain of Custody Sheet. (Note: all samples should be assigned a Region 10 lab number regardless of the analytical laboratory.)
4	Concentration	enter MEDIUM or LOW (This will normally have been determined in advance of the sampling)
	Matrix	Next enter SOIL, WATER, OR TISSUE
	Sample Description	Complete Sample description

①

SAS Number
1234 J

U.S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P.O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490 - FTS/557-2490

SPECIAL ANALYTICAL SERVICE
PACKING LIST

②

Sampling Office: REGION 10
Sampling Contact: JON DOUGH (name)
206-442-1200 (phone)

Sampling Date(s): 12/7/84
Date Shipped: 12/7/84
Site Name/Code:

Ship To: CONTRACT LAB
NAME / ADDRESS
Attn: LAB CONTACT

For Lab Use Only
Date Samples Rec'd:
Received By:

③ Sample Numbers	④ Sample Description i.e., Analysis, Matrix, Concentration	Sample Condition on Receipt at Lab
1. 84495152	MEDIUM SOIL next to #5 TANK OUTLET VALVE	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

For Lab Use Only

White - SMO Copy, Yellow - Region Copy, Pink - Lab Copy for return to SMO, Gold - Lab Copy

DIOXIN SHIPMENT RECORD

This form is used when shipping samples for DIOXIN analysis at a contract lab.

When completed -- KEEP YELLOW
Send WHITE to SAMPLE MANAGEMENT OFFICE
Send PINK + GOLD to Contract Lab

1	Case Number	Enter Case Number
	Batch Number	Enter 1 -- If a second sheet is required - enter 2 on the second sheet. See SMO version of instructions for this sheet for more detail.
2	Site Number	
	City/State	
	EPA Site Number	Leave Blank
	Latitude/Longitude/Tier	Fill in only for National Dioxin Sampling Program samples
	Sampling Office	10
	Sampling Contact	Project Officer
	Data Turnaround	Usually 40 days -- determine prior to sampling
3	Sample Numbers	Enter the number shown on the peel-off labels. There should be 2 peel-off labels with the same number. One goes on the LID, the other on the BOTTLE. Enter this number also on the Field Sample Data and Chain of Custody Sheet.

USEPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 Alexandria, Virginia 22313
FTS 8-557-2490 703/557-2490

①

CASE NO: 1057 **BATCH NO:** 1

CLP DIOXIN SHIPMENT RECORD

②

Site Name: ABC INC
City & State: SEATTLE WA
EPA Site No:
Latitude:
Longitude:
Tier: 1 2 3 4 5 6 7
(circle one)

Sampling Office: REGION 10
City & State: SEATTLE, WA
Sampling Contact: JON DOUGH
(name)
Sampling Date: 12/7/84
Data Turnaround:
15-Day ____ 30-Day X

Ship To: LAB NAME
Date Shipped: 12/7/84

③

SAMPLE NUMBERS	MATRIX		DESCRIPTION						ADD'L ANALYSIS
	SOIL/ SEDIMENT	OTHER:	FIELD SAMPLE	SAMPLE TO DUPLICATE	SAMPLE TO SPIKE	BLANK	EQUIPMENT RINSATE	OTHER: (SAS ONLY)	SPECIFY: (SAS ONLY)
DG004601	X		X						

DJ 0046 01 -DIOXIN
DJ 0046 02 -DIOXIN
DJ 0046 03 -DIOXIN
DJ 0046 04 -DIOXIN
DJ 0046 05 -DIOXIN
DJ 0046 06 -DIOXIN
DJ 0046 07 -DIOXIN
DJ 0046 08 -DIOXIN
DJ 0046 09 -DIOXIN
DJ 0046 10 -DIOXIN
DJ 0046 11 -DIOXIN
DJ 0046 12 -DIOXIN
DJ 0046 13 -DIOXIN
DJ 0046 14 -DIOXIN
DJ 0046 15 -DIOXIN
DJ 0046 16 -DIOXIN
DJ 0046 17 -DIOXIN
DJ 0046 18 -DIOXIN
DJ 0046 19 -DIOXIN
DJ 0046 20 -DIOXIN
DJ 0046 21 -DIOXIN
DJ 0046 22 -DIOXIN
DJ 0046 23 -DIOXIN
DJ 0046 24 -DIOXIN

WHITE—SMO Copy YELLOW—Region Copy PINK—Lab Copy for Return to SMO GOLD—Lab Copy

U.S. ENVIRONMENTAL PROTECTION AGENCY
Contract Laboratory Program

SAMPLE MANAGEMENT OFFICE

MEMORANDUM

DATE: July 6, 1984

TO: Primary Regional Sample Control Center Contacts

FROM: Linda Haas
Sample Management Office Linda Haas

SUBJECT: Dioxin Shipment Records

Attached please find a supply of the new Dioxin Shipment Records (DSR) and an instruction document for distribution to the CLP users in your Region. The DSR replaces the SAS Packing List which was used as an interim Dioxin Shipment Record. Use of the SAS Packing List for RAS Dioxins is to be discontinued at this time.

In addition to the DSR we will be supplying each Region with preprinted sample labels. Each duplicate set of labels will consist of twenty-four (24) sample numbers corresponding to a batch shipment (e.g., DA000101 through DA000124). I hope to have the labels ready for distribution in August.

If you or any of your users have questions about the use of the DSR, please feel free to call me at telephone number FTS-557-2490, 703/557-2490, or 703/683-0885.

cc: RSCC's (memo and one form)
Stan Kovell, CLP Program Manager
Fred Haeberer, CLP Project Officer
Joan Fisk, CLP Project Officer
Ross Robeson, EMSL/LV
Rob Laidlaw, NEIC
Dick Thacker, SMO Deputy Project Manager
Maka Grogard, SMO Dioxin Coordinator

P.O. Box 818, Alexandria, Virginia 22313. Phone: (703) 557-2490/FTS-8-557-2490

DIOXIN SAMPLE DOCUMENTATION
AND SHIPMENT INSTRUCTIONS

July 1984

Instructions for Completing DSR Form

A separate Dioxin Shipment Record (DSR) form is to be completed for each shipment of samples to a laboratory. First, enter the Case number on the top right corner of the DSR form, where indicated. The Case number is the identifying number that was assigned by SMO at the time the sampling was scheduled. This is followed by the Batch number, which is assigned by the sampler when samples are packed for shipment to the laboratory(ies).

The Batch number represents represents one shipment of up to twenty-four (24) samples from one specific location to one laboratory on one day and is assigned sequentially. For example, the first shipment of samples in a Case would be identified as Batch #1, the second shipment would be Batch #2, etc. When sampling occurs over several days, care must be taken not to repeat Batch numbers within the Case.

The use of Batch numbers allows for identification of groups of samples within a Case that are shipped to different laboratories and/or that are shipped on different days. The Batch number may also be used to signify a group of samples collected at a specific location within the overall site perimeter, should the site encompass a large geographical area.

Next, complete header information, excluding the areas on the top right of the form that are set off by bold lines. These areas are for laboratory use.

Make sure to mark either 15-day or 30-day data turnaround requirement, indicating the delivery terms arranged when scheduling the analyses with SMO.

Along with the DSR forms, the Region has two sets of labels bearing sample numbers. Two strips of labels containing the same series of 24 sample numbers are provided for use in labeling the sample bottles and the outer metal cans in which samples are packaged for shipment. The same numbered label must be placed on both the sample bottle and the outer metal can. In order to protect the labels from water or solvent attack, labels on both the sample container and the outer metal can should be covered with clear, waterproof tape.

Enter the Sample numbers (from the labels) on the lower left side of the DSR form, where indicated. Record all Sample numbers for samples included within the Batch shipment. (Extra numbered labels from the original strips of 24 should be discarded and new strips of labels should be used for the next Batch samples.)

For each sample, indicate sample matrix and description by checking the appropriate box in each category. There is also a block for indicating that additional analysis under Special Analytical Services is required for a sample. Check this block, if appropriate, and specify type of additional analysis required. (Any additional analytical work must be requested through SMO at the time sampling is scheduled, to ensure that proper arrangements can be made in advance to accommodate the request.)

After completion of the SMO DSR form, the bottom two copies of the completed DSR (pink and gold copies) are included with the sample shipment to the laboratory. The DSRs, as well as chain-of-custody documentation accompanying the sample shipment, should be enclosed in a clear plastic bag and securely taped to the underside of the lid of the shipping cooler.

Following sample shipment, distribute remaining DSR copies as follows:

- Mail top (white) copy to SMO at the address shown on the top of the DSR form.
- Second (yellow) copy of DSR form is retained by the sampler as the Region's file copy.

Procedures for Coordinating Sample Shipment

Immediately following sample shipment, call SMO, as appropriate, and provide the following information:

- Sampler name
- Batch number(s)
- Total number of samples included in each Batch
- Date of shipment
- Courier name and airbill number
- Type of shipment (e.g., overnight, two-day)
- Laboratory samples shipped to
- Any irregularities or anticipated problems with the samples
- Status of sampling project (e.g., final shipment, update of future shipping schedule)

SMO notifies the laboratory that samples are in transit and confirms arrival of the samples in good condition at the receiving laboratory. SMO assists in resolution of any problems concerning the samples, coordinating with the appropriate Regional or sampling personnel.

Upon sample receipt, the laboratory completes designated sections of the DSR, recording date of sample receipt and sample condition, signs the DSR, and returns a copy to SMO. SMO retains the laboratory-signed DSR copy as written confirmation of sample receipt.

USEPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 Alexandria, Virginia 22313
FTS 8-557-2490 703/557-2490

CASE NO: 2000 **BATCH NO:** 1

CLP DIOXIN SHIPMENT RECORD

Site Name: NAME
City & State: City Name, ST.
EPA Site No: MOD123456789
Latitude: 7 digit No.
Longitude: 8 digit No.
Tier: [✓ 1] 2 3 4 5 6 7 (circle one)

Sampling Office: REGION
City & State: City Name, ST.
Sampling Contact: NAME (name)
Sampling Date: MM-DD-YY
Data Turnaround: 15-Day ____ 30-Day ✓

Ship To: LAB
ATTN
Date Shipped: MM-DD-YY

	MATRIX		DESCRIPTION						ADD'L ANALYSIS
SAMPLE NUMBERS	SOIL/ SEDIMENT	OTHER: Solvent	FIELD SAMPLE	SAMPLE TO DUPLICATE	SAMPLE TO SPIKE	BLANK	EQUIPMENT RINSATE	OTHER: (SAS ONLY)	SPECIFY: (SAS ONLY)
DG000101	✓		✓						
DG000102	✓		✓						
DG000103	✓		✓						
DG000104		✓					✓		
DG000105	✓		✓						
DG000106	✓			✓					
DG000107	✓		✓						
DG000108	✓		✓						
DG000109	✓		✓						
DG000110	✓		✓						
DG000111	✓				✓				
DG000112	✓		✓						
DG000113	✓		✓						
DG000114	✓		✓						
DG000115	✓		✓						
DG000116	✓		✓						
DG000117	✓		✓						
DG000118	✓		✓						
DG000119	✓					✓			
DG000120	✓		✓						
DG000121	✓		✓						
DG000122	✓		✓						
DG000123	✓		✓						
DG000124	✓		✓						

WHITE—SMO Copy YELLOW—Region Copy PINK—Lab Copy for Return to SMO GOLD—Lab Copy

7.0 SAMPLE PACKAGING AND SHIPPING

7.1 Sample Packaging

7.1.1 Environmental Samples (low level)

- Not expected to be grossly contaminated with high levels of hazardous materials. Estimated to contain less than 10ppm of any contaminant.

a. Secure sample container lid and place it, properly identified, in a polyethylene bag and seal the bag.
b. Place the sample in a metal picnic cooler which has been lined with a large polyethylene bag.
c. Pack the cooler with enough noncombustible, absorbant, cushioning material to guard against container breakage.
d. Seal the large bag.
e. Documentation accompaning the shipment must be enclosed in a waterproof plastic bag and taped to the underside of the cooler lid.
f. Secure the cooler lid shut with fiber tape and custody seal tape.
g. Print "Environmental Samples" and "This End Up" on top of the cooler and put upward pointing arrows on all four sides.

7.1.2 Hazardous Material Samples

- Samples suspected of containing concentrations of contaminants of 10ppm to 15% (medium level) or greater that 15% (high level).

a. These samples when being transported by other than a government vehicle must be packaged, marked, labeled, and shipped according to DOT regulations.
b. Most hazardous samples are classified as flammable liquid or flammable solid shipments and require the following packaging procedure:
    1) Place the sample container, properly identified, in a polyethylene bag and seal the bag.
    2) Place the sample in a metal can, cushion it with vermiculite and secure the can lid tightly with clips or tape.
    3) On the metal can print or in label form show the Laboratory name and address and "Flammable Liquid, n.o.s. UN 1993" or "Flammable Solid, n.o.s. UN 1325."
    4) Place the metal can(s) into the plastic bag lined cooler, surround the can(s) with vermiculite, and seal the outer plastic bag.
    5) Documentation accompaning the shipment must be enclosed in a waterproof plastic bag and taped to the underside of the cooler lid.
    6) Secure the cooler lid shut with fiber tape and custody seal tape.
    7) The following DOT labels should be placed on top of the cooler: "Flammable Liquid, n.o.s." or "Flammable Solid, n.o.s.". A "Cargo Aircraft Only" label is needed if the net sample quantity is greater than 1 quart (liquid) or 25 pounds (solid).
    8) Print "Laboratory Samples" and "This End Up" an top of the cooler and put upward pointing arrows on all four sides.

7.2 Sample Shipping

7.2.1 Environmental vs/ Hazardous Sample Shipment

a. Environmental Samples
  - No DOT marking, labeling, or shipping papers are required, nor are there any DOT restrictions on the mode of transportation.

b. Hazardous Samples - medium and high concentrations
  1) Complete a carrier approved airbill or Shippers Certification for Restricted Articles providing the following information in the order listed:
     - "Flammable Liquid, n.o.s. UN 1993" or "Flammable Solid, n.o.s. UN 1325"
     - "Limited Quantity" (or "Ltd. Qty.")
     - Net weight or net volume of total sample material in cooler
     - "Laboratory Samples"
     - "Cargo Aircraft Only"
  2) Ship by airlines that ONLY carry cargo such a Federal Express, Emory, etc.
  3) DOT regulations do not apply to transport by government owned vehicles, including aircraft.

FEDERAL EXPRESS

PLEASE COMPLETE ALL INFORMATION IN THE 5 BLOCKS OUTLINED IN ORANGE
SEE BACK OF FORM SET FOR COMPLETE PREPARATION INSTRUCTIONS.

293233474

YOUR FEDERAL EXPRESS ACCOUNT NUMBER: 123456-7

DATE: 5/19/86

FROM (Your Name): JACK D. SAMPLER

COMPANY: DIRT DETECTIVES, INC. ① DEPARTMENT/FLOOR NO.

STREET ADDRESS: 987 CLEAN HOSE DR.

CITY: DIOXINVILLE, STATE: WA

AIRBILL NO. 293233474 ZIP (ACCURATE ZIP CODE REQUIRED FOR CORRECT INVOICING): 98188

TO (Recipient's Name): Q. A. CHEMIST

If Hold For Pick-Up or Saturday Delivery, Recipient's Phone Number

COMPANY: PRECISION LABORATORIES ② DEPARTMENT/FLOOR NO.

STREET ADDRESS (P.O. BOX NUMBERS ARE NOT DELIVERABLE): 1032 LABRADOR DR.

CITY: CLEANWATER, STATE: OR

ZIP (ACCURATE ZIP CODE REQUIRED FOR OVERNIGHT DELIVERY): 98202

IN TENDERING THIS SHIPMENT, SHIPPER AGREES THAT F.E.C. SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM CARRIAGE HEREOF. F.E.C. DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS SHIPMENT. THIS IS A NON-NEGOTIABLE AIRBILL SUBJECT TO CONDITIONS OF CONTRACT SET FORTH ON REVERSE OF SHIPPER'S COPY. UNLESS YOU DECLARE A HIGHER VALUE, THE LIABILITY OF FEDERAL EXPRESS CORPORATION IS LIMITED TO $100.00. FEDERAL EXPRESS DOES NOT CARRY CARGO LIABILITY INSURANCE.

YOUR NOTES/REFERENCE NUMBERS (FIRST 12 CHARACTERS WILL ALSO APPEAR ON INVOICE) ③

PAYMENT ☒ Bill Shipper ☐ Bill Recipient's F.E.C. Acct. ☐ Bill 3rd Party F.E.C. Acct. ☐ Bill Credit Card
☐ Cash in Advance Account Number/Credit Card Number

SERVICES
CHECK ONLY ONE BOX

☒ PRIORITY 1 (OVERNIGHT PACKAGES) (Up to 70 LBS.)

STANDARD AIR
☐ DELIVERY 2ND BUSINESS DAY FOLLOWING PICK-UP (Up to 70 LBS.)

ORM'S AND RADIOACTIVE MATERIAL ONLY

"OVERNIGHT" IS NEXT BUSINESS DAY (MONDAY THROUGH FRIDAY); TWO DAYS FROM ALASKA/HAWAII. SATURDAY DELIVERY AVAILABLE IN CONTINENTAL U.S. SEE "SPECIAL HANDLING."

DELIVERY AND SPECIAL HANDLING
CHECK SERVICES REQUIRED ④

1 ☐ HOLD FOR PICK-UP AT FOLLOWING FEDERAL EXPRESS LOCATION SHOWN IN SERVICE GUIDE. RECIPIENT'S PHONE NUMBER IS REQUIRED.
2 ☒ DELIVER
3 ☐ SATURDAY SERVICE REQUIRED See Reverse (Extra charge applies for delivery.)
4 ☒ RESTRICTED ARTICLES SERVICE (P-1 and Standard Air Packages only, extra charge)
5 ☐ SSS (Signature Security Service required, extra charge applies)
6 ☐ DRY ICE ______ LBS.
7 ☐ OTHER SPECIAL SERVICE ______
8 ☐ ______
9 ☐

PACKAGES	WEIGHT	DECLARED VALUE	O/S
		⑤	
TOTAL	TOTAL	TOTAL	

RECEIVED AT
SHIPPER'S DOOR
☐ REGULAR STOP
☐ ON-CALL STOP
☐ F.E.C. LOC. ______

Federal Express Corporation Employee No.

DATE/TIME For Federal Express Use

AGT/PRO

AGT/PRO

FEDERAL EXPRESS USE
FREIGHT CHARGES
DECLARED VALUE CHARGE
ADVANCE ORIGIN
ADVANCE DESTINATION
OTHER
TOTAL CHARGES

FEDERAL EXPRESS

PART #2041730764
REVISION DATE 10/82$
PRINTED U.S.A.

ORIGIN ACCOUNTING COPY

AIRBILL NUMBER
293233474

SHIPPER'S CERTIFICATION FOR RESTRICTED ARTICLES
(TYPE OR PRINT)

NO. OF PKGS.	PROPER SHIPPING NAME CLASSIFICATION IDENTIFICATION NO. (PER 49 CFR, 172.101)	NET QUANTITY PER PACKAGE
1	FLAMMABLE LIQUID, N.O.S. UN 1993 LIMITED QUANTITY LABORATORY SAMPLES CARGO AIRCRAFT ONLY	16 OZ.

ADDITIONAL DESCRIPTION REQUIREMENTS FOR RADIOACTIVE MATERIALS (SEE BACK)

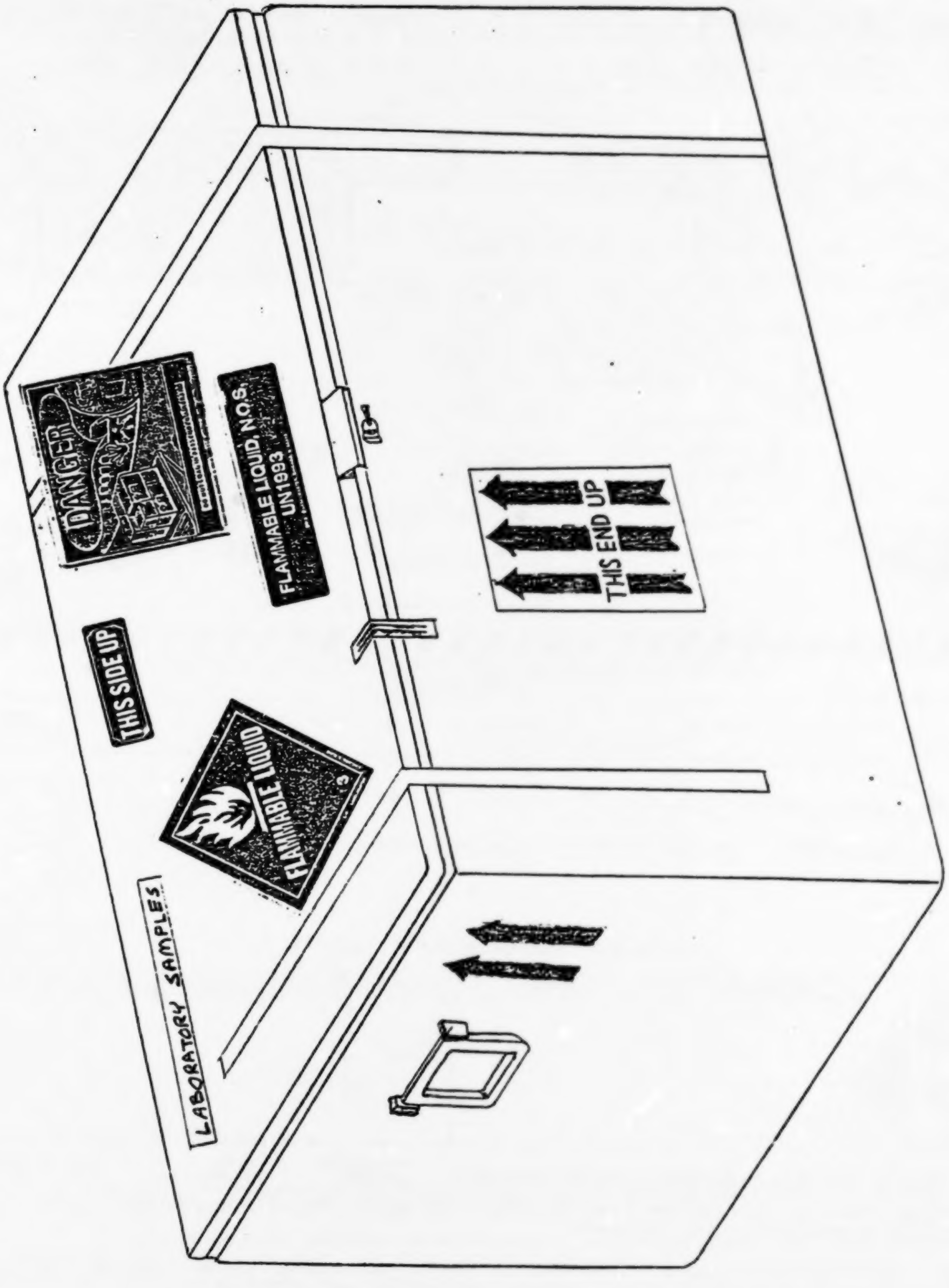
RADIONUCLIDE	FORM	ACTIVITY	CATEGORY OF LABELS	TRANS. INDEX	PACKAGE IDENTIFICATION

THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR ~~PASSENGER AIRCRAFT~~ [✓ CARGO AIRCRAFT ONLY] (DELETE-NONAPPLICABLE)

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS OR TREATMENT.

I HEREBY CERTIFY THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME AND ARE CLASSIFIED, PACKED, MARKED, AND LABELED, AND IN PROPER CONDITION FOR CARRIAGE BY AIR ACCORDING TO APPLICABLE NATIONAL GOVERNMENTAL REGULATIONS.

NAME AND TITLE OF PERSON SIGNING CERTIFICATION	EMERGENCY TELEPHONE NO.	SIGNATURE OF SHIPPER
JACK D. SAMPLER - DETECTIVE	206 442-9999	Jack D. Sampler


DANGER
FLAMMABLE LIQUID, N.O.S.
UN1993
THIS SIDE UP
FLAMMABLE LIQUID
3
LABORATORY SAMPLES
THIS END UP

8.0 SHIPPING LOGISTICS AND NOTIFICATION

8.1 Shipping Logistics

a. When making a shipment under $150.00 with Alaska Airlines or Federal Express simply provide the carrier with their respective shippers account number (acquired from Andy Hess or Mary Moore) and the bill will go directly to the finance office.
b. To use other airlines or when a charge exceeds $150.00 use a Government Bill of Lading (GBL) acquired from Duane Taylor or prepare a Procurement Request (PR).
c. We have established account numbers for Western, Horizon, Northwest Orient, and Republic airlines which can be used for billings less than $150.00 provided a Procurement Request is completed and submitted to Mary Moore immediately upon shipment.
d. It is prudent to take a GBL to the field for possible unforseen needs. These are accountable forms and must be returned to the issuing officer if not used.
e. Do NOT send shipments COD.
f. If samples are not delivered directly to the lab, inform the carrier to "notify on arrival" and give them the lab's phone number (EPA lab 442-0370).
g. RETURN your copy of the airbill to Mary Moore, M/S 337.

8.2 Sample Shipment Notification

- Immediately after delivering the shipment to the carrier, call the Sample Management Office (8 557-2490, CLP shipments) or the Manchester Lab (206 442-0370, or FTS 8 399-0370) and give the following information:

1. Airbill number
2. Name of carrier
3. Exact number and type of samples, including QA samples
4. Estimated date and time of arrival
5. Any deviations from standard procedures

U.S. GOVERNMENT BILL OF LADING

MEMORANDUM COPY B/L NO. R-0639349

TRANSPORTATION COMPANY TENDERED TO: CONSOLIDATED FREIGHTWAYS

ROUTE ORDER/RELEASE NO.

STOP THIS CAR OR TRUCK AT

FOR

CAR, TRUCK OR CONTAINER INITIALS AND NO.

KIND

IMPORTANT

Issuing office is to retain one memorandum copy and send one to the fiscal office.

CAR-TRUCK-CONTAINER* ORDERED	CAR-TRUCK-CONTAINER* FURNISHED	MARKED CAPACITY* ORDERED	MARKED CAPACITY* FURNISHED	DATE FURNISHED*	DATE B/L ISSUED

*Length/cube

*Furnish this information in case of carload/truckload shipments only

If extra services are ordered see Administrative Directions No. 2 on reverse

CFWY PRO NUMBER — DEST. SIC
050- 04160-0
BMW ◆ CC
ORG. SIC — CIRCLE ONE — DEST. SIC

Receiv… named… order… destina… like goo… …t to conditions … apparent good … forwarded to … be delivered in

FROM Andy Hess M/S 329/LAB
7411 Beach Dr.
(Shipping point) Port Orchard, WA 98366

FULL NAME OF SHIPPER
United States Environmental Protection Agency

CONSIGNEE (Name, address and ZIP code)
USEPA (Western Processing Test)
200 SW 35th. Street c/o Bill Miller
Corvallis, OR 97333 (no Saturday delivery)

MARKS

DESTINATION (Name, address and ZIP code of installation)
U.S. Environmental Protection Agency
200 SW 35th. St. c/O Bill Miller
Corvallis, OR 97333 (no Saturday delivery)

BILL CHARGES TO (Dept./agency, bureau/office, mailing address and ZIP code)
U.S. Environmental Protection Agency
1200 Sixth Avenue, Finance, M/S 313
Seattle, Wa. 98101-3188

VIA (Route shipment when advantageous to the Government)

APPROPRIATION CHARGEABLE
PE0087 PSGB10P616 2209 Approp. #6820X8145
EST. $40.00

SEAL NUMBERS

APPLIED BY:

FOR CARRIER'S USE ONLY — WAYBILL NO. OR FREIGHT BILL NO.
050-04160-0

Contractor will return unused or canceled bills of lading to the Government office from which received.

PACKAGES NO.	PACKAGES KIND	DESCRIPTION OF ARTICLES (Use carrier's classification or tariff description if possible; otherwise use a clear nontechnical description.)	NUMBERS ON PACKAGES	WEIGHTS*
2		Ice Chests containing environmental samples.		120 LBS

If this shipment fully loads the car or truck used, check ☐ YES

TARIFF OR SPECIAL RATE AUTHORITIES (CL, TL or Vol. only)

CARRIER FURNISHED SERVICE AT ORIGIN ☐ PICKUP ☐ TRAP-CAR Initials of shipper's agent:

B/L NO. R-0639349

FOR USE OF ISSUING OFFICE

CONTRACT OR PURCHASE ORDER NO. OR OTHER AUTHORITY

DATED

NAME OF TRANSPORTATION COMPANY: Consolidated Freightways

F.O.B. POINT NAMED:

DATE OF RECEIPT OF SHIPMENT: 1-9-86

Initial carrier's agent, by signature below, certifies he received the Original Bill of Lading.

ISSUING OFFICER (Name and title): Duane Taylor, Shipping Clerk

DATE: 2/19/85

SIGNATURE OF AGENT

PER (2)

ISSUING OFFICE (Name and complete address)
U.S. Environmental Protection Agency
1200 6th Ave. M/S 349, Seattle, Wa. 98101-3188

THIS CONSIGNMENT DELIVERED COMPLETE AND IN APPARENT GOOD ORDER EXCEPT AS MAY BE INDICATED HEREAFTER ☐ SHORTAGE ☐ DAMAGE ☐ CARRIER OS&D REPORT ATTACHED

SERVICE FURNISHED … NATION … DELIVER…

*Show also cubic measurements for shipments via

5/84

9.0 EQUIPMENT CLEANING AND RETURN PROCEDURES

9.1 Sample Gear Cleaning Procedure

a. Dispose of wood tongue depressors and other disposable sampling gear.
b. If practical cover meters and samplers with clear plastic prior to use so that at the completion of work the plastic can be discarded minimizing followup cleaning.
c. Clean meter and sampler housing with a mild detergent and wipe dry. Be careful not to get any electronic components wet.
d. Basic cleaning procedure for sampling gear:
  1) Detergent wash and scrub if necessary
  2) Tap water rinse
  3) Acid (HCl and/or HNO_3) rinse where there is heavy metal contamination*
  4) Distilled water rinse
  5) Solvent (acetone and/or methylene chloride) rinse for non-plastic materials*
  6) Air dry
  * Wear neoprene gloves and allow for good ventilation
e. A pressure steam cleaner is available for heavy duty cleaning
f. Always clean gear ASAP after use

9.2 Sample Gear Return

1. Assure all meters and samplers are "off" and packed properly in their carring cases if provided.
2. All gear is to be cleaned prior to return.
3. Return field gear, supplies, and unused sampling containers to: Andy Hess, Regional Field Equipment Center, EPA Region 10 Lab, 7411 Beach Dr. E., Port Orchard, WA, 98366.
4. If the field gear is not to be directly delivered to the lab, specify the carrier to "notify on arrival, Andy Hess 442-0370".
5. NEVER return sampling gear in the same cooler with samples.

SECTION 10

SAFETY AND HEALTH

TABLE OF CONTENTS

10.1 Rights and Responsibilities
10.1.1 Employee Rights
10.1.2 Employee Responsibilities
10.1.3 Supervisors Responsibilities

10.2 Training Requirements
10.2.1 EPA Order 1440.2
10.2.2 Region 10 Policy on Health, Safety and Proficiency Training
10.2.3 Hazardous Materials Incident Response Training Program

10.3 Occupational Medical Monitoring Program
10.3.1 Overview

10.4 Protective Clothing and Equipment
10.4.1 Basic Clothing for Samplers
10.4.2 Stock Services and Procurement Requirements
10.4.2.1 Non-Disposable Clothing
10.4.2.2 Disposable Clothing and Equipment

10.5 Occupational Health and Safety Regulations
10.5.1 Overviews
10.5.2 OSHA 29 CFR 1910
10.5.3 State OSHA Regulations
10.5.4 EPA Occupational Health and Safety Manual
10.5.5 EPA Region 10 Policies and Guidelines
10.5.6 In-Plant or Company Policies
10.5.7 State-of-the-Art Factor

TABLE OF CONTENTS

10.6 Site Safety and Health Plans
10.6.1 General Requirements
10.6.2 Region 10 Generic Site Safety & Health Plans
10.6.3 Site Safety & Health Plans
10.6.4 Sources for Assistance

10.7 Hazardous Duty Pay
10.7.1 Overview

10.8 Special or Unique Sampling Requirements
10.8.1 Reconize Your Limitations
10.8.2 Sources for Assistance
10.8.2.1 Region 10 Field Hazardous Waste Investigation Team
10.8.2.2 Region 10 Emergency Response Section and TAT Team
10.8.2.3 Region 10 FIT Team

10.9 On-The-Job Injuries and Accident Reporting
10.9.1 Basic Requirements
10.9.3 Emergency Considerations

10.1 RIGHTS AND RESPONSIBILITIES

10.1.1 EMPLOYEE RIGHTS

- EPA employees are entitled to work under safe and healthful conditions, free of recognized hazards.
- If an investigation or inspection activity is unsafe, it should be postponed.
- EPA employees are entitled to have basic and when necessary specific safety and health training.
- Employees are entitled to personal protective clothing and equipment
- Field employees are entitled to participate in the occupational medical monitoring program.
- EPA employees are entitled to report hazardous working conditions, without any adverse consequences, and they have the right to make the reports anonymously if they wish.

References:

1. Occupational Safety and Health Act, Section 19
2. Presidential Executive Order 12196
3. EPA Occupational Health and Safety Manual

10.1.2 EMPLOYEE RESPONSIBILITIES

- Employees are responsible for complying with the Agency's health and safety standards and regulations.
- Employees are responsible for reporting accidents, injuries, and property damage of $100.00 or more.
- Reporting unsafe and unhealthful working conditions
- Responsible for having a baseline medical examination to confirm their fitness for duty.
- Employees are responsible for using the safety clothing and equipment provided.
- Employees are responsible for reporting to work ready, willing and able to perform assigned duties.
- All employees are expected to observe all rules, signs, and instructions relating to personal safety.
- Willful non-observance of certain safety regulations constitute grounds for disciplinary action.

10.1.3 SUPERVISOR'S RESPONSIBILITIES

Supervisors are responsible for:

- The health and safety of their employees.
- Compliance with the Agency's Occupational Health and Safety requirements.
- For enforcing correct work practices.
- For providing safety and health training.
- For purchasing and providing personal protective clothing and equipment for their employees.

10.2 TRAINING REQUIREMENTS

10.2.1 EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities

- Established three levels of training and certification commensurate with the degree of anticipated hazards.
- Requires all field employees have at least 3 days of health and safety training prior to becoming involved in normal, routine activities.
- Requires 8 hours of refresher training be given to field employees annually covering health and safety.
- Requires new employees to perform 3 days of field OJT within 3 months of classroom instruction.

10.2.2 Region 10 Policy on Health and Safety and Proficiency Training February 6, 1986.

- Establishes "program specific" health and safety training requirements for Region 10 Laboratory and field employees.
- Establishes a certification process for initial and refresher health and safety training requirements.
- Describes medical monitoring requirements for Region 10 field employees.
- Establishes non-compliance provisions for failure to satisfy the training requirements.
- This policy was designed to conform to the intent of EPA Order 1440.2 (July 12, 1981).
- Established a "Grandparent Clause" and requires full compliance by October 1, 1986.

10.2.3 Hazardous Materials Incident Response Training Program

As part of a comprehensive program for protecting the public and the environment from chemical incidents resulting from vehicle or train accidents, spills, discharges from industrial operations, and hazards associated with uncontrolled waste sites, the Hazardous Response Support Division, Environmental Response Branch, develops and presents training courses in safety and technical operations related to hazardous material responses.

The courses presented by the Environmental Response Branch last from 3 to 5 days. Although each course is tailored to cover technical material, relevant to the course title, no course will provide participants with exhaustive treatment of any subject. All courses emphasize the practical application of lecture information through problem-solving, case studies, demonstrations, and outdoor exercises. These courses are periodically held in various Region 10 locations as well as other locations throughout the United States.

SOME OF THE COURSES OFFERED ARE:

- Hazardous Material Incident Response Operations
- Personnel Protection and Safety
- Sampling for Hazardous Materials
- Air Surveillance for Hazardous Materials
- Incident Mitigation and Treatment Methods
- Hazard Evaluation and Environmental Assessment
- Response Safety Decision Making

10.3 OCCUPATIONAL MEDICAL MONITORING PROGRAM

The Region 10 Occupational Medical Monitoring Program is designed to serve as a "watch" over the health of those employees whose work regularly poses the possibility of exposure to toxic material or other hazardous working conditions. It is not a direct substitute for "general check-up" or other periodic examinations designed to monitor or promote general health. The occupational medical monitoring program is designed to screen for evidence of adverse effects of occupational exposure, particularly exposure to toxic substances.

OBJECTIVES OF THE PROGRAM:

- To detect adverse effects of occupational exposure.
- Initiate prompt corrective action when needed.
- Insure fitness for duty.

FOUR TYPES OF EXAMINATIONS ARE PROVIDED:

- Baseline - (Critical for new employees)
- Periodic - (Usually annual exams)
- Acute exposure monitoring
- End of employment or termination exams.

10.4 PROTECTIVE CLOTHING AND EQUIPMENT

10.4.1 Basic Personal Protective Clothing and Equipment Items for Field Inspectors.

- Steel toed leather safety shoes or boots
- Hardhat (faceshield is optional)
- Safety glasses or chemical splash goggles
- Cotton/polyester coveralls

The following clothing and equipment items may be required for certain types of inspections based on the activities or toxic material on site:

- Steel toed chemical resistant rubber boots
- Chemical resistant gloves (Inner and Outer)
- Disposable boot covers
- Acid splash suit
- Disposable chemical resistant coveralls with attached hood
- Noise reducing ear plugs or muffs
- Respiratory Protective Equipment
- Duffle Bag

EPA inspectors must wear equivalent or higher levels of protection than the on-site or company employees when performing inspections. Under no circumstances should an EPA field inspector enter areas wearing respirators or other protective clothing that does not meet the same protection level worn by in-plant or on-site workers. This does not mean that an EPA inspector can borrow or wear a respirator or protective clothing provided by the company or facility being inspected. It is Region 10 policy that our field inspectors go out prepared with the proper equipment and clothing to perform the inspection safely using EPA provided equipment.

10.4.2 STOCK SOURCES AND PROCUREMENT REQUIREMENTS

During the budget process, it was agreed by all concerned that the Environmental Services Division would supply all field inspectors with disposable clothing and equipment items. Non-disposable clothing and equipment items must be purchased by the respective branch, division or operation office employing the field inspector. This does not mean that unusually large quantity requirements of disposable items will automatically be furnished by ESD. Orders for large quantities or unusual items, even though disposable, must be ordered by the respective branch, division or operation office.

The field employee and his or her supervisor are responsible for insuring the employee has the proper safety and health clothing and equipment to perform their work safely. The supervisor/Branch Chief is responsible for purchasing the safety clothing and equipment needed by the employee. The Regional Safety Officer can provide assistance in the type of clothing or equipment to purchase and the various suppliers available for purchasing this material.

The ESD contact for disposable clothing and equipment is Andy Hess. His telephone number is 442-0370.

DISPOSABLE CLOTHING INCLUDES:

- Cartridges and canisters for respirators
- Inner and outer chemical resistant gloves
- Disposable booties
- Disposable coveralls
- Ear plugs
- Cleaner/Sanitizer for respirators
- Duct tape
- Trash bags
- Hard hats (non-disposable but furnished by ESD)

OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

10.5 OVERVIEW

We are governed by OSHA and EPA Safety and Health Regulations. Since we are a federal agency, we must meet the OSHA Standards. You must be aware and conscious of the fact that contractors and state employees must abide by the state OSHA Regulations (where applicable) which may be more stringent than the federal OSHA Standards. EPA Region 10 staff should abide by the state regulations if they are more stringent than the federal OSHA Standards.

SOME OF THE REGULATIONS AND GUIDELINES ARE:

- 29 CFR 1910 - OSHA Standards
- State OSHA Regulations (where applicable)
- EPA Occupational Health and Safety Manual
- EPA Region 10 Policies and Guidelines
- In-plant or Company Policies
- State-of-the-Art Factor

Copies of these regulations and guidelines are available through the Regional Safety Officer (Ron Blair) at 442-0370.

10.6 SITE SAFETY AND HEALTH PLANS

The purpose of a site safety and health plan is to establish procedures and requirements for protecting EPA employees investigating or inspecting facilities, sites or other areas where sampling and monitoring activities are conducted. The content of a safety and health plan is dependent on the degree of risk associated with the inspection or survey activity. The greater the hazards or risk, the more information and procedural requirements needed for the plan.

A site safety and health plan may be as simple and short as adding a short narrative or discussion to the sampling plan. For example, simple investigations which require the collection of a few environmental samples may only require several paragraphs in the sampling plan. On the other hand, an investigation of an abandoned hazardous waste site suspected of containing highly toxic materials in drums and tanks will require a detailed site safety and health plan.

In emergency response situations, the sample site safety plan included in the EPA Standard Operating Safety Guides, Annex 10 can be used. It should be completed on the way to the incident by the Team Leader. If all EPA field employees involved in the response have had the required training covering personal protection and safety, levels of protection, and other EPA protocol, then this sample safety plan format may be used. It should be read and signed by all employees involved in the investigation, as should all site safety and health plans for each activity.

SOME OF THE GENERAL REQUIREMENTS FOR A HAZARDOUS WASTE TYPE OF SURVEY OR INSPECTION SITE SAFETY PLAN ARE:

- Background of the site
- Hazard evaluation
- List of EPA personnel and their responsibilities
- Levels of protection for each activity
- Delineate work areas
- Establish procedures to control site access
- Decontamination procedures
- Site emergency procedures
- Emergency medical care

10.6 CONTINUED

- Air monitoring and environmental surveillance
- Specific training required
- Establish procedures for weather related problems

WE NOW HAVE THREE GENERIC SITE SAFETY AND HEALTH PLANS FOR:

- Asbestos inspections at demolition/renovation sites
- PCB inspections
- Placer mine inspections

10.7 HAZARDOUS DUTY PAY

EPA has developed and issued procedures covering hazardous duty pay. You must be an EPA employee in order to request and receive hazardous duty pay.

THE FOLLOWING ARE SOME OF THE GENERAL GUIDELINES FOR PAYMENT OF HAZARDOUS DUTY PAY:

- If levels A,B or C categories of protection are required during an emergency response, waste removal, or other situation involving hazardous conditions, then hazard pay should be authorized in advance, provided that all other regulatory requirements are met.
- Helicopter flights requiring the execution of unusual patterns to avoid obstructions, enter sheltered valleys, and deep narrow canyons, avoid turbulent winds, or land on isolated lakes amidst mountainous or wooded terrain warrant hazardous duty pay.
- Low-level (i.e. under 500') helicopter flight operations over wooded or open water areas involving flight at low altitudes or landing at unprepared sites in wooded or mountainous terrain warrant hazardous duty pay.

10.8 SPECIAL OR UNIQUE SAMPLING REQUIREMENTS

One of the most important things an EPA sampler or field employee should consistently remember and follow is recognize your limitations. This is especially true when only one employee is involved in the survey or inspection activity. The importance of collecting a sample during a specific environmental incidence or episode is just simply not worth it if collecting the sample will involve risk to life or health.

- Occasionally, EPA inspectors may need to request additional assistance in collecting samples under unique and hazardous situations. There are three groups that can be called on for additional assistance, depending on the program area, time required, and other factors associated with the specific site. They are:
    - The Regional Field Hazardous Waste Investigation Team. The contact for this source of assistance is the Chief, Field Operations and Technical Support Branch, ESD.
    - The Regional Superfund Removal and Emergency Section and their contracted Technical Assistance Team (TAT Team). The contact for this assistance is the Chief, Superfund Removal and Emergency Section.
    - The Region 10 Field Investigation Team (FIT-Remedial Investigations). The contact for this source of assistance is the Chief, Field Operations and Technical Support Branch.

10.9 ON-THE-JOB INJURIES AND ACCIDENT REPORTING

10.9.1 BASIC REQUIREMENTS

The EPA Occupational Health and Safety Manual, Chapter 3, Accident and Illness Investigation, Reporting, and Recordkeeping Requirements outlines the requirements for reporting on-the-job accidents or illnesses. A copy of this manual has been distributed and should be maintained by each division and operations office.

PROCEDURES FOR THE REPORTING OF INFORMATION ON ACCIDENTS OR ILLNESS INCIDENTS BY THE EMPLOYEE AND SUPERVISOR ARE AS FOLLOWS:

- THE EMPLOYEE MUST:

  1. Report any job-connected incidents to his or her supervisor immediately.
  2. Furnish accurate and detailed information regarding the incident on EPA Form 1440-9.
  3. Complete a CA-1 form, if an occupational injury is involved.
  4. Complete a CA-2 form if an occupational illness is involved.
  5. Complete an SF-91 form if a vehicular accident is involved.
  6. Provide the attending physician or hospital with a CA-16 form signed by the supervisor.

- THE SUPERVISOR MUST:

  1. Sign and complete Part A of form CA-16, Request for Examination and/or Treatment. This form basically commits the federal government to paying for the medical services, and the supervisor should ensure that the injury or illness occurred on the job before signing this form.
  2. Investigate all job-connected incidents within two working days of the incident and complete EPA Form 1440-9.
  3. Complete Optional Form 26, Data Bearing Upon Scope of Work where vehicular collision is involved.

19.9.2 EMERGENCY CONSIDERATIONS

In an emergency situation, get treatment as soon as possible for the injured employee and do not worry about the forms. They can be completed and filled out later.

Emergency planning and services available are a very important element of a good site safety plan. Everyone on the sampling team should know where the nearest telephone is located and whether or not they are in an emergency 911 telephone area. If not, the telephone numbers for the emergency services should be listed in the site safety plan. It may be necessary on some investigations to carry cellular telephones or radios for emergency communication purposes. Emergency situations in remote locations are very critical aspects of sampling or field activities in these types of areas. All team members or EPA employees should know what to do in these situations and discuss what they are going to do if a medical emergency occurs in a remote location. This type of sampling will usually require at least two and probably three employees to be involved in this type of investigation.

11.0 Data Access / The Laboratory Management System

11.1 Introduction
11.2 Program TRNPRT
11.3 Program PRJDMP
11.4 Program LABTAB1
11.5 Program LABTAB3
11.6 Program LABTAB4

11.0 Data Access / The Laboratory Management System

11.1 Introduction

The Laboratory Management System is the database on the PDP 11/70 for the storage of sample analysis results from the EPA, Manchester Lab. Recently, we have started entering contract laboratory data into the database. The data is entered by the laboratory and retrieved for the Project Officers by the Regional Sample Control Center.

Within the LMS, there are five general programs that generates sample analysis reports.

1. TRNPRT (pronounced 'tran * print')
2. PRJDMP (pronounced 'project * dump')
3. LABTAB1 (pronounced 'lab * tab * one')
4. LABTAB3 (pronounced 'lab * tab * three')
5. LABTAB4 (pronounced 'lab * tab * four')

A detailed explanation and example of each report type can be found on the attached pages.

Normally, the project officer will receive output from the PRJDMP program when all analyses have been completed. Partial data retrievals can be requested annd will automatically be provided should only one fraction delay the completion of all requested analyses. Contact the Regional Sample Control Center for data retrievals.

Any data stored in the Lab Management System can also be transferred to the IBM PCs where graphs and charts can be generated. Upon request the RSCC will transfer data and aid in the manipulation of the data.

11.2 Program Name: TRNPRT (pronounced 'tran * print')

Description: Generates a report containing all data entry transactions containing the sample analysis results of a given sample with multiple parameters (TRNIN1) or a given parameter analysis of multiple samples (TRNIN2).

Example of Report:
Attachment A - TRNIN1
Attachment B - TRNIN2
Attachment C - Long Version

```
16-SEP-85           EPA Region X Lab Management System              Page    1
                        ***  Lab Analysis Report  ***


==> Transaction #: 03051141

Work Group:         (71) Pest/PCB - PP Scan

Instrument: (GCT-EC  ) Tracor GC 222 No.1, Ni-63 EC Detecto

Method: (EP2-608      ) GC Ext Scan

Chemist:           (RHR) Rieck, Bob         ESD      Hours Worked:


Project: AMB-034B  OREGON RIVERS                             Prg Ele#: A53B2F

Prj Off: Cleland, Bruce     ESD     Analysis Due:          Revised Due:


                 *** Sample Records in Transaction ***

Parameter Form File: PEST         Title: Pesticide Analysis

Seq#    Sample #    Date/Time   Description
----    ---------- ----------- ------------------------------------------
 01     84500851   840731      TILLAMOOK OYSTERS


 Record Type: TRNIN1      Date Verified:  85/04/23     By: Beckner, Laura M.  ESD
Transaction Status: Verified Transaction...Ready to release.
                     *** Verified and Transferred to VERTRANS ***
Processed: 16-SEP-85 07:25:37   Status: V  Batch: A  (ln VFR DB)
```

ATTACHMENT A - continued

```
16-SEP-85             EPA Region X Lab Management System               Page     2
                        *** Lab Analysis Report ***

Transaction #: 03051141                      (71) Pest/PCB - PP Scan
Proj Code : AMB-034B  OREGON RIVERS                               PE # : A53B2F

Sample Id:                         84500851
Matrix:                              Tissue
Units:                                ug/kg
% Slds:
QA Code:
Date Extract:                        850110
Date Analyzd:                        850116
 1 Aldrin                                1U
 2 Chlordane                             1U
 3 Dieldrin                              1U
 4 DDT, 4,4'-                           10
 5 DDE, 4,4'-                            8
 6 DDD, 4,4'-                            1U
 7 Endosulfan, alpha-                    1U
 8 Endosulfan, beta-                     1U
 9 Endosulfan sulfate                    1U
10 Endrin                                1U
11 Endrin aldehyde                       1U
12 Heptachlor                            1U
13 Heptachlor epoxide                    1U
14 BHC, alpha-                           1U
15 BHC, beta-                            1U
16 BHC, gamma-                           1U
17 BHC, delta-                           1U
18 Toxaphene                            30U
19 PCB - 1016                           10U
20 PCB - 1221                           10U
21 PCB - 1232                           10U
22 PCB - 1242                           10U
23 PCB - 1248                           10U
24 PCB - 1254                           10U
25 PCB - 1260                           10U
26 Methoxychlor
27 DDE (I.S.)        IntStd %RC
```

ATTACHMENT B 11.2

```
16-SEP-85              EPA Resion X Lab Manasement System              Pase    1
                          ***  Lab Analysis Report  ***

Transaction #: 03220915   Seq #: 01        (31) Metals - PP

Prj: OREGON RIVERS                                 (AMB-034B)     A53B2F     BRC
Par:  MERCURY TISMG/KG  WET WGT                    (Par#    71930 S)

  Instrument: ACF403   AA Cold Flame (PE403)
  Method: EP1-245.1    Mercury, Cold Vapor, Manual
  Chemist: (RYA) Araki, Roy A.      ESD  Hours Worked:
  Lab Prep:(  ) Unspecifed                Date Preprd:      Date Anlyzd: 850118

Matrix: (70) Tissue                Units: (23) ug/gm

Line   Sample #     Result    Sample Location/Description               #Days to Anl
----  ----------- ---------  ---------------------------------------- ------------
  1   84 500851       .012    TILLAMOOK OYSTERS                         841120 ( 59)
  2   84 500853       .011    TILLAMOOK OYSTERS                         841120 ( 59)
  3   84 500855       .012    COOS BAY OYSTERS                          841120 ( 59)
  4   84 500857       .019    COOS BAY OYSTERS                          841120 ( 59)
  5   84 500858       .613    MALHEUR LAKE CATFISH                      841120 ( 59)
  6   84 500860       .329    SANTIAM SUCKER - TISSUE                   841120 ( 59)
  7   84 500862       .528    COLUMBIA SLOUGH SUCKER-TISSUE             841120 ( 59)
  8   84 500864       .550    YAMHILL SUCKER-TISSUE                     841120 ( 59)
  9   84 500866       .066    ROGUE SUCKER - TISSUE                     841120 ( 59)
 10   84 500868       .515    SP&S RAILROAD BR.-SUCKER TISSUE           841120 ( 59)
 11   84 500870       .134    WHEATLAND FERRY SUCKER TISSUE             841120 ( 59)
 12   84 500872       .417    TUALATIN SUCKER TISSUE                    841120 ( 59)
 13   84 500874       .212    DESCHUTES SUCKER TISSUE                   841120 ( 59)
 14   84 500876       .575    UMPQUA SQUAWFISH TISSUE                   841120 ( 59)
 15   84 500878       .515    UMPQUA SUCKER TISSUE                      841120 ( 59)
 16   84 500880       .057    KLAMATH RIVER SUCKER TISSUE               841120 ( 59)
 17   84 500882       .105    STAUFFEER SUCKER TISSUE                   841120 ( 59)
 18   84 500884       .112    MAKENZIE SUCKER TISSUE                    841120 ( 59)
 19   84 500886       .768    OWYHEE RESERVIOR C.S. SUCKER-TISSUE       841120 ( 59)
 20   84 500888       .027    OWYHEE RESERVOIR -B.LIP TISSUE            841120 ( 59)
 21   84 500890       .051    MALHEUR BRIDGELIP SUCKER TISSUE RM 10     841120 ( 59)
 22   84 500892       .212    MALHEUR COARSESCALE SUCKER TISSUE RM 1    841120 ( 59)
 23   84 500894       .474    MALHEUR COARSESCALE SUCKER TISSUE RM 6    841120 ( 59)
 24   84 500896       .840    OWYHEE RIVER RM2 COARSESCALE SUCKER TI    841120 ( 59)
 25   84 500898       .729    OWYHEE RVR RM 19 COARSESCALE SUCKER TI    841120 ( 59)



 Record Type: TRNIN2       Date Verified:  85/03/22     By: Roberson, Ray       ESD
Transaction Status: Verified Transaction...Ready to release.
                      *** Verified and Transferred to VERTRANS ***
Processed: 16-SEP-85 07:25:37   Status: V  Batch: A  (In VER DB)
```

```
14-MAY-86         EPA Region X Lab Management System              Page     5
                     ***  Lab Analysis Report  ***

Transaction #: 04220830   Seq #: 04        (74) PCB Scan
Proj Code : HWD-053A  QUEEN CITY FARMS                        PE # : GB10P629

Sample No.: 86 144603               Alternate Keys:
Station # :              Description: NORTH WASTE PILE, NW CORNER
Source: Sludge (General)       Tox/Haz: Y  Enforcement: Y  Confidential: N
Begin Date: 860403 1150  End Date:            Received Date: 860404 0935
Comments:

Instrument: GCT-570     Method: EP2-608       Chemist: Rieck, Bob        ESD
Samp Matrix: (40) Sediment                  Units: (22) ug/kg     %Slds: 89.2
QA Code: (     ) Unspecifed                Lab Prp: (   ) Unspecifed
Date Extracted: 860409  Date Analyzed: 860418      # Days to Ext/Anal:    6/  9

Line      Par #    Parameter Description           Units       Value
----  ---------    ----------------------------  --------  ---------
   1   12674112    PCB - 1016                    ug/ks          450U
   2   11104282    PCB - 1221                    ug/kg          450U
   3   11141165    PCB - 1232                    ug/kg          450U
   4   53469219    PCB - 1242                    ug/kg          450U
   5   12672296    PCB - 1248                    ug/kg          450U
   6   11097691    PCB - 1254                    ug/kg          450U
   7   11096825    PCB - 1260                    ug/kg       7300
   8          0    DDE (I.S.)                    Pct Recv        NAI
```

11.3 Program Name: PRJDMP (pronounced 'project * dump')

Description: PRJDMP Generates a report that provides a one-page statement of sample analysis results for each sample number requested.

Example of Report: Attachment A

```
09:41:43                      *** Sample/Project Analysis Results ***

  Project: TEC-222b                       MARINE PUMPS AND EQUIPMENT                    Officer: SXK    Account: A5302F

 Sample No: 85 250850  Begin Sample Date: 85/06/14 08:30      Source: Sediment (General)      Depth:          QA Code:

Laboratory: RX                   Description: WA BARNES (UNUSED SANDBLAST SAND)

 -----------------------------------------------
| Metals-Specified              Sediment        |
| Parameter                     Result Units    |
 ------------------------------------ ---------
 Arsenic    Sedmg/kg            3,466  Dry Wgt
 Ba Mud     Dry Wgt                17  mg/kg-Ba
 Cd Mud     Dry Wgt              4.72  mg/kg-CD
 Chromium   Sedmg/kg            104.8  Dry Wgt
 Copper     Sedmg/kg            4,470  Dry Wgt
 Lead       Sedmg/kg              REQ  Dry Wgt
 Silver     Sedmg/kg             4.23  Dry Wgt
 Zinc       Sedmg/kg           14,350  Dry Wgt
 Selenium   Sedmg/kg              1.5  Dry Wgt
 MERCURY    SED-PULP            0.003  MG/KG WT

 -----------------------------------------------
| Metals - EP Toxicity          EPT-Slu         |
| Parameter                     Result Units    |
 ------------------------------------ ---------
 Arsenic    As,Tot                  1  ug/l
 Barium     Ba,Tot                170  ug/l
 Cadmium    Cd,Tot               29.8  ug/l
 Chromium   Cr,Tot                 10  ug/l
 Copper     Cu,Tot               5326  ug/l
 Lead       Pb,Tot                 56  ug/l
 Silver     Ag,Tot                0.1  ug/l
 Zinc       Zn,Tot              2,075  ug/l
 Selenium   Se,Tot                  4  ug/l
 Mercury    Hg,Total            0.050  ug/l

 -----------------------------------------------
| Organics - General            Sediment        |
| Parameter                     Result Units    |
 ------------------------------------ ---------
 OIL-GRSE   MUD FRGR              REQ  MG/KG
 Lead       Sedmg/kg            2,420  Dry Wgt

 -----------------------------------------------
| VOA - PP Scan (GCMS)          Sediment        |
| Parameter                     Result Units    |
 ------------------------------------ ---------
 Methane, Tetrachloro-         REQ
 Methane, Trichloro-           REQ
 Benzene                       REQ
 Ethane, 1,1,1-Trichloro       REQ
 Methane, Bromo-               REQ
 Methane, Chloro-              REQ
 Ethane, Chloro-               REQ
 Ethylene, Chloro-             REQ

 ------------------------------------------------
| VOA - PP Scan (GCMS)          Sediment         |
|           *** Continued ***                    |
| Parameter                     Result Units     |
 ------------------------------------ ---------
 Methane, Dichloro-            REQ
 Methane, Tribromo-            REQ
 Methane, Dichlorobromo-       REQ
 Ethane, 1,1-Dichloro-         REQ
 Ethylene, 1,1-Dichloro-       REQ
 Methane, Trichlorofluor       REQ
 Methane, Dichlorodifluo       REQ
 Propane, 1,2-Dichloro-        REQ
 Ethane, 1,1,2-Trichloro       REQ
 Ethylene, 1,1,2-Trichlo       REQ
 Ethane, 1,1,2,2-Tetrach       REQ
 Benzene, Ethyl-               REQ
 Acrolein                      REQ
 Ethane, 1,2-Dichloro-         REQ
 Acrylonitrile                 REQ
 Toluene                       REQ
 Benzene, Chloro-              REQ
 Ether, Chloroethyl Viny       REQ
 Methane, Chlorodibromo-       REQ
 Ethylene, Tetrachloro-        REQ
 Ethylene, 1,2-Trans-Dic       REQ
 Propylene, 1,2-Dichloro       REQ

 ------------------------------------------------
| B/N/Acid Scan                 Sediment         |
| Parameter                     Result Units     |
 ------------------------------------ ---------
 2-Methylnapthalene                10U ug/kg-dr
 Unknown                           30U ug/kg-dr
 Pyrene, benzo[a]-                 10U ug/kg-dr
 Phenol, 2,4-Dinitro-              10U ug/kg-dr
 Anthracene, Dibenzo[a,h           10U ug/kg-dr
 Anthracene, benzo[a]-             10U ug/kg-dr
 M-Cresol, P-Chloro-               10U ug/kg-dr
 Aniline                        REQ
 Nitrosamine, Dimethyl-         REQ
 Benzoic Acid                      10U ug/kg-dr
 Ethane, Hexachloro-               10U ug/kg-dr
 Cyclopentadiene, Hexach           10U ug/kg-dr
 Isophorone                        10U ug/kg-dr
 Acenaphthene                      10U ug/kg-dr
 Phthalate, Diethyl-               10U ug/kg-dr
 Phthalate, Di-n-butyl-            10U ug/kg-dr
 Phenanthrene                      10U ug/kg-dr

 ------------------------------------------------
| B/N/Acid Scan                 Sediment
|           *** Continued ***
| Parameter                     Result Units
 ------------------------------------ ---------
 Phthalate, n-Butyl Benz           10U ug/kg-dr
 Nitrosamine, Diphenyl-            10U ug/kg-dr
 Fluorene                          10U ug/kg-dr
 Butadiene, Hexachloro-            10U ug/kg-dr
 Phenol, Pentachloro-              10U ug/kg-dr
 Phenol, 2,4,6-Trichloro           10U ug/kg-dr
 Phenol, 2-Nitro-                  10U ug/kg-dr
 Napthalene                        10U ug/kg-dr
 Napthalene, 2-Chloro-             10U ug/kg-dr
 Benzidine, 3,3'-Dichlor           10U ug/kg-dr
 Benzidine                      REQ
 o-Cresol                          10U ug/kg-dr
 Benzene, 1,2-Dichloro-            10U ug/kg-dr
 Phenol, 2-Chloro-                 10U ug/kg-dr
 Phenol, 2,4,5-Trichloro           10U ug/kg-dr
 Benzene, Nitro-                   10U ug/kg-dr
 Phenol, 4-Nitro-                  10U ug/kg-dr
 Benzyl Alcohol                    10U ug/kg-dr
 Ether, 4-Bromophenyl Ph           10U ug/kg-dr
 Phenol, 2,4-Dimethyl-             10U ug/kg-dr
 p-Cresol                          10U ug/kg-dr
 Benzene, 1,4-Dichloro-            10U ug/kg-dr
 Aniline, p-Chlor-                 10U ug/kg-dr
 Phenol                            10U ug/kg-dr
 Ether, bis[2-Chloroethy           10U ug/kg-dr
 Methane, bis[2-Chloroet           10U ug/kg-dr
 Phthalate, bis[2-Ethylh          100B ug/kg-dr
 Phthalate, Di-n-Octyl             10U ug/kg-dr
 Benzene, Hexachloro-              10U ug/kg-dr
 Anthracene                        10U ug/kg-dr
 Benzene, 1,2,4-Trichlor           10U ug/kg-dr
 Phenol, 2,4-Dichloro-             10U ug/kg-dr
 Toluene, 2,4-Dinitro-             10U ug/kg-dr
 Pyrene                            10U ug/kg-dr
 Phthalate, Dimethyl               10U ug/kg-dr
 Dibenzofuran                      10U ug/kg-dr
 Perylene, Benzo[g,h,i]-           10U ug/kg-dr
 Pyrene, Indeno[1,2,3-c,           10U ug/kg-dr
 Fluoranthene, 3,4-Benzo        REQ
 Fluoranthene                      10U ug/kg-dr
 Fluoranthene, Benzo[k]-           10U ug/kg-dr
 Acenaphthylene                    10U ug/kg-dr
 Chrysene                          10U ug/kg-dr
 o-Cresol, 4,6-Dinitro-            10U ug/kg-dr

                       (Continued on next page)
```

ATTACHMENT - A 11.3

```
16-SEP-85                         EPA Region X Lab Management System                                  Page
07:23:49                        *** Sample/Project Analysis Results ***

  Project: AMB-0348                          OREGON RIVERS                               Officer: BRC    Account: A5

 Sample No: 84 500851   Begin Sample Date: 84/07/31   :         Source: Tissue (General)       Depth:         QA Code:

                          End Sample Date: 84/11/20   :                                        Comp:            Freq:

 ---------------------------------------------
 : Metals-Specified             Tissue        :
 : Parameter                    Result Units  :
 ------------------------------------ --------
 ARSENIC   TISMG/KG                .34  WET WGT
 MERCURY   TISMG/KG               .012  WET WGT
 LEAD      TISMG/KG               .02U  WET WGT
 COPPER    TISMG/KG              35.00  WET WGT
 CR-FISH   UG/G  DR                .38  MG/KG WT
 CADMIUM   TISMG/KG                .69  WET WGT

 ---------------------------------------------
 : Metals - PP                  Tissue        :
 : Parameter                    Result Units  :
 ------------------------------------ --------
 MERCURY   TISMG/KG               .012  WET WGT

 ---------------------------------------------
 : Pest/PCB - PP Scan           Tissue        :
 : Parameter                    Result Units  :
 ------------------------------------ --------
 DDT, 4,4'-                         10  ug/kg
 Chlordane                          1U  ug/kg
 BHC, Gamma-                        1U  ug/kg
 Dieldrin                           1U  ug/kg
 Endrin                             1U  ug/kg
 DDD, 4,4'-                         1U  ug/kg
 DDE, 4,4'-                         8   ug/kg
 Heptachlor                         1U  ug/kg
 Aldrin                             1U  ug/kg
 BHC, Alpha-                        1U  ug/kg
 BHC, Beta-                         1U  ug/kg
 BHC, Delta-                        1U  ug/kg
 Endosulfan, Alpha-                 1U  ug/kg
 Heptachlor Epoxide                 1U  ug/kg
 Endosulfan Sulfate                 1U  ug/kg
 Endrin Aldehyde                    1U  ug/kg
 Toxaphene                         30U  ug/kg
 PCB-1260 (Arochlor 1260           10U  ug/kg
 PCB-1254 (Arochlor 1254           10U  ug/kg
 PCB-1221 (Arochlor 1221           10U  ug/kg
 PCB-1232 (Arochlor 1232           10U  ug/kg
 PCB-1248 (Arochlor 1248           10U  ug/kg
 PCB-1016 (Arochlor 1016           10U  ug/kg
 Endosulfan, Beta-                  1U  ug/kg
 PCB-1242 (Arochlor 1242           10U  ug/kg


                                         (Sample Complete)
```

11.4 Program Name: LABTAB1 (pronounced 'lab * tab * one')

Description: LABTAB1 generates a table report for up to eight lab numbers across the top of a page and up to fifty STORET parameter numbers down the side of the page.

Example of Report: Attachment A

ATTACHMENT A - 11.4

```
Lab Management System: Station Table Program (LABTAB1)                                             Run Date: 16-SEP-85

                                  EXAMPLE OF REPORT GENERATED BY THE PROGRAM 'LABTAB1'

                      Lab #  # 84 500851  # 84 500853  # 84 500855  # 84 500857  # 84 500858  # 84 500860  # 84 500861
                    Station TILLAMOOK OY TILLAMOOK OY COOS BAY OYS COOS BAY OYS MALHEUR LAKE SANTIAM SUCK SANTIAM SUCK
                       Date    84/07/31     84/07/31     84/09/26     84/09/26     84/09/21     84/09/17     84/09/17
                       Time
---------------------------  -----------  -----------  -----------  -----------  -----------  -----------  -----------
ARSENIC   TISMG/KG WET WGT          .34          .28          .82          .84          .04 U        .04 U        .09
CADMIUM   TISMG/KG WET WGT          .64          .52          .70          .92          .01          .01 U       .039
CR-FISH   UG/G  OR MG/KG WT         .36          .02 U        .12          .64          .02 U        .12           --
COPPER    TISMG/KG WET WGT        35.00        27.00        48.00        64.00          .80         1.10          1.9
LEAD      TISMG/KG WET WGT          .02 U        .02 U        .02 U        .02 U        .02 U        .02 U        .03 U
MERCURY   TISMG/KG WET WGT         .012         .011         .012         .019         .013         .329          .05
*** End of Processing ***
```

11.5 Program Name: LABTAB3 (pronounced 'lab * tab * three')

Description: LABTAB3 creates a table report for up to eight lab sample numbers across the top of a page and up to fifty CAS parameter numbers down the side.

Example of Report: Attachment A

ATTACHMENT A - 11.5

```
Lab Management System: Station Table Program (LABTAB 3)                                  Run Date: 16-SEP-85   Time: 07:13:

                                         EXAMPLE OF REPORT GENERATED BY THE PROGRAM 'LABTAB3'
                                                       PESTICIDES AND PCBs

                        Lab #:  # 84 500851  # 84 500853  # 84 500855  # 84 500857  # 84 500858  # 84 500860  # 84 500861
                      Station: TILLAMOOK OY TILLAMOOK OY COOS BAY OYS COOS BAY OYS MALHEUR LAKE SANTIAM SUCK SANTIAM SUCK
                         Date:   84/07/31     84/07/31     84/09/26     84/09/26     84/09/21     84/09/17     84/09/17
                         Time:
                       Matrix:    Tissue       Tissue       Tissue       Tissue       Tissue       Tissue       Tissue
               Analysis units:    ug/kg        ug/kg        ug/kg        ug/kg        ug/kg        ug/kg        ug/kg
 ---------------------------  -----------  -----------  -----------  -----------  -----------  -----------  -----------
 Aldrin                               1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Chlordane                            1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Dieldrin                             1 U          1 U          1 U          1 U          1 U          1 U          5 U
 DDT, 4,4'-                          10           10           10           11            1 U        312          146
 DDE, 4,4'-                           8            8            3            8            5          310          720
 DDD, 4,4'-                           1 U          1 U          7            1 U          1 U         43          275
 Endosulfan, Alpha-                   1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Endosulfan, Beta-                    1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Endosulfan Sulfate                   1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Endrin                               1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Endrin Aldehyde                      1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Heptachlor                           1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Heptachlor Epoxide                   1 U          1 U          1 U          1 U          1 U          1 U          5 U
 BHC, Alpha-                          1 U          1 U          1 U          1 U          1 U          1 U          5 U
 BHC, Beta-                           1 U          1 U          1 U          1 U          1 U          1 U          5 U
 BHC, Gamma-                          1 U          1 U          1 U          1 U          1 U          1 U          5 U
 BHC, Delta-                          1 U          1 U          1 U          1 U          1 U          1 U          5 U
 Toxaphene                           30 U         30 U         30 U         30 U         30 U         30 U        150 U
 PCB-1016 (Arochlor 1016)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 PCB-1221 (Arochlor 1221)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 PCB-1232 (Arochlor 1232)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 PCB-1242 (Arochlor 1242)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 PCB-1248 (Arochlor 1248)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 PCB-1254 (Arochlor 1254)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 PCB-1260 (Arochlor 1260)            10 U         10 U          1 U         10 U         10 U         10 U         50 U
 Methoxychlor                        --           --           --           --           --           --           --

     *  Indicates known or suspected carcinogen


 (End of Processing)
```

ATTACHMENT A - 11.6

```
Lab Management System Parameter Table Program (Labtab4)                                                Run Date: 16-SEP-85     page

                                                          EXAMPLE OF REPORT GENERATED BY THE PROGRAM 'LABTAB4'

                                                                                 ARSENIC    CADMIUM    CR-FISH    COPPER      LEAD     MERCURY
                                                                                TISMG/KG   TISMG/KG   UG/G  DR   TISMG/KG   TISMG/KG   TISMG/KG
                                                                                 WET WGT    WET WGT   MG/KG WT    WET WGT    WET WGT    WET WGT
Station                                          Date     Time      Lab#          1004      71940      71939      71937      71936      71930
-------------------------------------------- -------- ----   -------- ---------- ---------- ---------- ---------- ---------- ----------
TILLAMOOK OYSTERS                            84/07/31           500851         .34        .09        .38      35.00       .02U       .012
TILLAMOOK OYSTERS                            84/07/31           500853         .28        .52       .02U      27.00       .02U       .011
COOS BAY OYSTERS                             84/09/26           500855         .82        .70        .12      48.00       .02U       .012
COOS BAY OYSTERS                             84/09/26           500857         .84        .92        .64      64.00       .02U       .019
MALHEUR LAKE CATFISH                         84/09/21           500858        .04U        .01       .02U        .80       .02U       .013
SANTIAM SUCKER - TISSUE                      84/09/17           500860        .04U       .01U        .12       1.10       .02U       .329
SANTIAM SUCKER-LIVER                         84/09/17           500861         .39       .039         --        1.9       .03U        .05
*** End of Processing ***
```

11.6 Program Name: LABTAB4 (pronounced 'lab * tab * four)

Description: LABTAB4 generates a table report for up to six STORET parameter numbers across the top of a page and up to fifty lab sample numbers (either single numbers or a range of samples) down the side.

Example of Report: Attachment A

LIST OF RESULT QUALIFIERS FOR NON NUMERIC RESULTS

A result qualifier indicates the reason the analysis did not produce a numerical result.

Qualifier	Full name	Definition
FPS	Failed Preliminary Screening	A preliminary screening of the sample for the subject parameter was conducted.
NSQ	Not Sufficient Quantity	There was not a sufficient quantity of the sample to conduct an analysis to determine the concentration of the subject parameter.
LAC	Laboratory Accident	There was an accident in the laboratory that either destroyed the sample or rendered it not suitable for analysis.
FAC	Field Accident	There was an accident in the field that either destroyed the sample or rendered it not suitable for analysis.
ISP	Improper Sample Preservation	Due to improper preservation of the sample it was rendered not suitable for analysis.
NAI	Not Analyzed Due to Interference	Because of uncontrolled interference the analysis for the subject parameter was not conducted.
NAR	No Analysis Result	There is no analysis result. Reason is unspecified.
CAN	Cancelled	The analysis of this parameter was cancelled and not performed.
FQC	Failed Quality Control	The analysis result is unusable because quality control limits were exceeded when the analysis was conducted.
BDL	Below Detectable Limits	There was not a sufficient concentration of the parameter in the sample to exceed the lower detection limit in force at the time the analysis was performed.
E	Exponent	Used to report results with large values. The value is equal to the number before E times 10 to the power of the number after E.

List of Remark Codes

A remark code is used to qualify a data value.

Remark Code	Definition
B	Analyte is found in the blank as well as the sample, indicates possible/probable blank contamination.
J	Estimated value; value not accurate.
M	Presence of material verified but not quantified.
U	Compound was analyzed for but not detected. The number is the minimum detection limit.
UJ	Compound was analyzed for but not detected. The number is the estimated minimum detection limit.

12.0 LEGAL CONSIDERATIONS

Three general issues to discuss: (1) Gaining entry to a site; (2) Legal issues relating to activities on-site; (3) Post inspection issues.

12.1 Gaining entry to a site

- Consent

- "Conditional" consent: conditions cannot be accepted if they improperly limit EPA's statutory rights to enter and inspect. Improper conditions include:

  (1) requirements not only to sign visitors' log (that's ok), but "hold harmless" or "indemnification" agreements
  (2) requirements of prior notice
  (3) "confidentiality" agreements
  (4) restrictions on use of photographs
  (5) allowing entry only to portions of the facilities, or consent to some but not all of the inspectors.

- Obtaining an inspection warrant in the event of denial or "conditional" consent (legally equivalent to denial): Bases for obtaining civil warrant are (1) reason to believe a violation is occurring or has occurred, or (2) selection of site pursuant to a "neutral administrative scheme"

- Warrant also naming state inspectors as EPA "Authorized representatives"

- Executing a warrant: need to make a return of warrant "giving inventory of samples and documents obtained

12.2 Legal Issues Relating to Activities Conducted On-Site

- Chain-of-custody procedures for all samples taken: labeling, proper storage, etc., keep the "links" strong and few
- Splitting samples with site operator
- Inspectors' notebooks: may be discoverable through a request for production of documents in litigation, subject to FOIA re Congressional subpoena: keep them objective, well-organized, and identify in the notebook any information given confidentiality by company or by informant
- Estoppel: operators may attempt to tie Government's hands by asserting that they relied upon something you said, and preventing Government from taking position (e.g. an enforcement) different from one allegedly taken by you. Be circumspect in your comments to site operator.

12.3 Post-Inspection Issues

- Responding to claims of confidentiality
- Press relations: may indicate facts of inspection, but not recommendations or views as to enforcement or other follow-up
- Appearing as a witness in deposition, hearing, or trial (see attached list of pointers for prospective witnesses)
- Expert witness training seminar: valuable training in the litigation process and in testifying as an expert witness

POINTS FOR PROSPECTIVE WITNESSES (Second Version)

1. ALWAYS TELL THE TRUTH. As a witness in a federal criminal case it is your absolute duty to tell the truth to the best of your ability. Do that and let the chips fall where they may - what effect the facts may have on the prosecution or the defense is solely the concern of the judge or jury, not of the witness.

2. DON'T VOLUNTEER INFORMATION YOU ARE NOT ASKED. In your living room you can inject comments nobody has asked you to make. In Court you can't. Confine your answers to what you are asked, because information you volunteer may be inadmissible evidence or may be irrelevant to the case. If you are right that the information you might want to volunteer is important, one lawyer or the other will ask you.

3. DO NOT TELL WHAT OTHER PEOPLE SAID OR WHAT YOU THINK UNLESS YOU ARE SPECIFICALLY ASKED TO DO SO. If you are asked what someone said or what you think about something, you can answer the question. But in most cases "hearsay" and opinions are improper in Court. Unless you are specifically asked to tell about a conversation or to give your opinion, assume that every question calls solely for what you actually saw, heard, or did. Above all, don't volunteer hearsay or opinions you are not asked to give.

4. IF YOU SEE A LAWYER STARTING TO STAND UP, WAIT FOR THE OBJECTION. If you see a lawyer for the Government or for the defense starting to get up, he probably wants to object to a question you were asked. He has the right to have the judge rule on the objection before your answer. Don't jump the gun and answer first. If the Judge says "Objection overruled," then you may answer.

5. YOU CANNOT BE ASKED LEADING QUESTIONS ON DIRECT EXAMINATION. As a Government witness, you cannot be asked "leading" questions by the Government on direct examination. A leading question is one which contains a suggested

answer. For example, "Were you able to see the defendant aim a gun at the car?" is leading. Or, "Isn't it a fact that . . ." is a leading question. Since the Government cannot lead you, you have to remember all of the facts pertinent to every question you are asked yourself, without help from the lawyer. Take your time and be sure to answer the question completely. If you are asked "Did anything else happen at that time?" or "Was anything else said" you can be sure you have omitted a fact which you mentioned to the U. S. Attorney or to a Government agent previously. Take your time and think back to what else may have happened which you failed to mention. Do not quickly answer "No" unless you are sure your answer is complete.

6. YOU CAN REFER TO DOCUMENTS IF YOU NEED TO. It is usually more effective if you can testify from memory without looking at anything. But if you need to look at something to refresh your recollection, you can. "May I see a copy of my statement to the FBI, I think that will refresh my recollection on that exact date," or a similar answer is entirely proper for you to say from the stand, on either direct examination by the Government or on cross-examination.

7. DON'T GUESS. If you don't know the answer to a question, just say so. It is wrong to guess if you don't actually know the answer. If you know most of the answer but not all of the details, you can say so. For example, if you are asked, "When did your last see the defendant" and you know the month or year but not the date, don't say "I can't recall", say that you can recall the approximate but not the exact time, and state it to the best of your recollection. But never guess if you have no first hand information.

8. DO NOT ASSUME THAT LONG-PAST EVENTS ARE ALWAYS DIM IN YOUR MEMORY.

Some witnesses will say in answer to a question "That was five years ago and so I can't remember" or "My recollection is poor for what happened that far back."

This is usually wrong and misleading. The importance of an event is usually more important than how long ago it was in determining how well you can remember it. Charts of memory have proven that most forgetting takes place within a very short time after the event. You may remember Pearl Harbor Day in 1941 and may not remember what you had for breakfast two days ago. If what you saw or heard struck you as important or unusual, you can probably remember it clearly even if it was a long time ago. If that is true and if you are asked, say so. If you don't remember something, just say "I don't remember". The chances are that you don't remember it because it didn't strike you as important at the time.

9. NEVER GET ANGRY. Some cross-examiners try to get witnesses angry so that they will make an error that the cross-examiner can dramatize. When you are angry, you are least likely to do your duty as a witness, which is to give truthful answers. If a lawyer tries to anger you, remember that he has a purpose. Your best reply is to remain absolutely calm and answer the questions. Remember that nothing a lawyer says is evidence of anything unless it is answered affirmatively by the witness. Remember that you are a witness and are not on trial in the case, no matter what you may be asked. If questions are too insulting, the Government may object, but it is much better if the witness can remain calm and handle every question without help from the Government. If you have made any mistakes in connection with the case, just admit them and the suspense will be gone from the subject. If you haven't, you should have no problem either.

10. BE SURE YOU UNDERSTAND THE QUESTION. If you don't absolutely understand a question, ask the examiner to explain what he means. This is especially important if the question is vague or contains value-judgment words, such as "Isn't it a fact that the defendant was always open and above-board in his dealings?" A question like

that can cause your answer to be misleading unless you have it clarified as to just what is meant.

11. BEWARE OF COMPOUND QUESTIONS. If you are asked several questions rolled into one, it will usually be impossible to answer accurately unless you break them down. In such a case, you may say, "That contains several aspects, which I'll try to answer one by one." Or, if the questions is too long, you can say, "Can you break that down for me and ask me the questions one at a time."

12. BEWARE OF LEADING QUESTIONS CONTAINING HALF-TRUTHS. Witnesses are frequently asked leading questions suggesting information that is either half true or contains facts not within the witness's knowledge. Such questions frequently sound plausible on their face, and there is a temptation to answer them "Yes" or "No" when that would not be accurate. If a question contains information that partly true and partly false, an explanation is necessary. The explanation should be in your own words. Don't allow a cross-examiner to put words in your mouth. Remember that the judge or jury will draw conclusions from your answers. The lawyer is not there to engage in polite conversations. He is trying to establish facts that he thinks will help his client. It is your duty to see to it that whatever is established by your testimony is "the truth, the whole truth, and nothing but the truth."

13. BEWARE OF YES OR NO. Some witnesses have the notion that all questions should be answered "Yes" or "No." That is frequently untrue. Many questions cannot be answered accurately with "Yes " or "No" because they contain half-truths or ambiguous phrases that can be misinterpreted later if answered "Yes" or "No." These are the questions that call for an explanation and in response to which you should state the facts of what happened in your own words. If the lawyer asks you to answer "Yes or No", you are entitled to tell him that it can't be answered "Yes or No" without the

answer being misleading. If he insists, you can say something like, "If it has to be answered 'Yes or No' I suppose the answer would be 'No..' It should be explained or it is misleading." The Court will not direct you to answer "Yes or No", unless the question permits that kind of answer.

14. "ISN'T IT A FACT" Be careful of questions start "Isn't it a fact that . . ." or "The fact is . . ., isn't it?" These are usually leading questions containing implications that may be only partly true and that require an explanation.

15. YOU MAY BE INTERRUPTED. When you explain an answer, you may often be interrupted by the cross-examiner, who will start the next question. Let him finish and then bring him back to your unfinished answer. "Before I answer that, I want to finish my answer to our last question." This is very important because the cross-examiner may try to stop you when you have answered the rest of the question that explains the first part of the answer. You have to say whether you were finished, because the Government counsel doesn't know if you were through or not.

16. BEWARE OF EXACT DISTANCES AND TIMES. The cross-examiner will frequently suggest to you distances and times of events when your do not recall the actual time or distance. Do not agree with him unless your would independently arrive at the same estimate as he gives. If you make an estimate, be sure to say it's only an estimate.

17. YOU HAVE TALKED WITH GOVERNMENT REPRESENTATIVES. There is no secret about the fact that you have talked with an Assistant U.S. Attorney or with other Government agents. Indeed there is no secret, of course, about anything you know about the case once you are on the stand. You will be under oath to tell whatever you know that you are asked. Some witnesses think there is something improper about talking to the prosecutor before trial and when asked if they talked with anyone will answer "No." The credibility of such a witness is, naturally, entirely destroyed because no lawyer will put a witness

on the stand without talking with him first. Your conversations with Government agents may, however, be the subject of leading questions designed to create a false impression. For example, if you are asked "Did you discuss your testimony?" and say "No" the impression is that you didn't talk with anyone; if you say "Yes" the implication is that you were told what to say. Here as with other leading questions, state the facts in your own words. For example, if it is true you can say "I talked with the Assistant and he asked me questions, and then went over it with me to see if his impression of what I knew was correct. He told me to tell the truth."

18. YOU MAY BE ASKED ABOUT PRIOR STATEMENTS. Under the law, defense counsel may get to see prior statements you may have made to Government agents. One group of questions may be designed to learn whether you made such statements. If you did sign a written statement, or if someone took notice while you were interviewed, there is no secret about that. On the other hand, if you are not sure, do not assume that someone was taking notes. That may lead defense counsel to demand nonexistent notes and could prove embarrassing to the Government. If you are not sure whether notes were taken or whether you signed a statement, you can simply say that you can't recall.

19. DON'T BE UPSET IF THERE ARE SOME INCONSISTENCIES. Anytime a person tells the same story twice, no matter how carefully, there are likely to be at least some inconsistencies. If there is an inconsistency with a prior statement you made, simply tell the best recollection you have of what happened, and if there is an explanation for the inconsistency, give it. Sometimes it can't be your mistake, but the mistake of the one who took your statement. If that is so, simply say that your recollection is that you told him something else, and you believe it's his mistake.

20. YOU DON'T HAVE TO DISCUSS THE CASE WITH ANYONE. It is possible that the defendant, his counsel or someone on his behalf may ask to talk with you about the case. You are entirely free to do that if you want to. But you don't have to. Whether you do or not is entirely up to you. It is not up to the Government to tell you that you should or that you shouldn't discuss the case with the defense. But you should understand that you have no legal obligation to talk with anyone unless you wish to. The only time you are required to answer questions is on the witness stand on direct or cross-examination, and if the defense wants to subpoena you, they can do so and you will have to answer their questions on the stand. That is the only time you are required to talk. If you do discuss the case prior to taking the stand with the defendant or his counsel, remember that you will be asked about any claimed inconsistencies between what you say on the stand and what the defendant or his counsel may believe you told them. You will not have a stenographic transcript to establish what you said or did not say. In the event, of course, that you are subjected to any threats or pressure, you should contact the U.S. Attorney's Office immediately. Should that happen, try to note down exactly what was said to you as soon after the event as you can.

21. REMAIN DIGNIFIED ON THE STAND AT ALL TIMES. As a witness called on behalf of the United States in a federal criminal case, it is your duty to remain dignified on the stand at all times. Do not chew gum or have things which you may have brought with you, other than necessary records, in your hands while testifying. Wear appropriate clothing. In some cases, witnesses have appeared in combat boots to testify in Federal Court. This makes a poor impression on the Court. Never wisecrack in answer to a question or try to make fun of the cross-examiner. He has a right to ask questions and have them answered in a serious manner. Do not answer a question with another question unless it is to ask the cross-examiner to clarify what he is asking. Answers such as "How am I supposed to remember?" or "what would you have done?" are improper.

22. YOU ARE PERFORMING AN IMPORTANT PUBLIC SERVICE. By testifying in a federal criminal trial, you are performing an important service for your country and

fulfilling an important duty as a citizen. Some witnesses look on testifying as an inconvenience. This is wrong, because if we wish to have the benefits of law enforcement we have to do our part to establish the facts. Whether there has been a violation, of course, is for the Court or jury to decide, not for you. Even if your knowledge seems small, it may form a crucial part of a larger mosaic that must be established for the case to be decided properly. You should look on the duty to testify as an opportunity to play a significant part in an important function of Government rather than an absolutely necessary requirement. The length of time other witnesses will take is largely beyond the control of the Government, as it depends on the length of cross-examination.

13.0 LABORATORY CONSIDERATIONS

13.1 INTRODUCTION

To many people, the laboratory is something like a magical "Black Box", where samples of every conceivable form is sent in one door, and then, given enough time and urgent phone calls to the chemists, the answers are wondrously, if not belatedly, received through the answer door. There is a little bit more to it than that; a great deal of preparation of samples must be done. There are intruments that need calibration and quality assurance samples to be done . After that, the reports must be calculated, and the data verified and entered into the computer. The types of analyses that are performed by the laboratory vary in the degree of complexity, but a rule of thumb that can be used is that the more answers that can be gleaned from a single analysis, the more complex the analysis, and the more effort and time that has to be invested into the procedure. The purpose of this section is to familiarize the reader more closely with the amount of work involved with each analysis to give him/her more appreciation of the effort and costs needed.

The reader should also understand that there is a tremendous amount of "overhead" associated with sample handling that does not appear on the data report sheets; sample storage, dumping, hazardous waste handling, quality assurance, and maintenance of supplies and instruments are also needed to keep the lab functioning and does not permit the chemist or biologist to work only on samples all of the time. Continual bureaucratic and administrative folderol also occupy a significant amount of time. The reader should also remember that one analyst performs several different types of analyses; the commitment of a person to one analysis means that others will not be done at that time.

13.2 SAMPLE LOG-IN AND DOCUMENTATION PROCEDURES

When samples are received in the laboratory, they must first be logged into the laboratory data system. At this point, the analyst is unaware that they are at the lab. To keep track of all the loose ends that could possibly occur, records must be unambiguous from the beginning. The beginning means THE BEGINNING. Of utmost importance, the paperwork that accompanies the samples to the laboratory must be complete and clear in order to expedite the log-in process. If the paperwork is wrong, resolving discrepencies takes time away from other duties, slowing the entire process. If there are problems and the person doing the logging cannot contact the sampler to clarify questions, the samples are in limbo for that much longer before they can be analyzed. The speed at which the samples are entered into the system also depends on other factors that are beyond the control of the lab; e.g., if the PDP-1170 is burdened with several users at the same time, or if it is taking a vacation, the entry process can be slowed considerably.

The first step in logging in samples is to verify that there is a sample for every sample number on the Field Sample Data Sheet. The number and types of sample containers are noted and checked that the analyses requested are appropriate for the containers present. An in-house form is prepared to document this step.

The next step for the records person is to enter the field data into the computer, establish the computer reporting forms for entering data into the computer, and generate bench data sheets for the chemists to transcribe the data onto. Bench data sheets are not generated for the pesticides, PCBs, or GC/MS organics analyses. GC/MS header sheets will be generated in the near future by the computer printer. Finally, a file is prepared to store all of the hardcopy data for the particular survey to be kept in the records room.

The amount of time required by this procedure depends a great deal upon the number of samples and analyses requested, and how unencumbered the computer is. For 10 samples for organic parameters, with all variables at the optimum level, the amount of time needed would be about 2 hours. If there are problems with the paperwork, that time would increase varying amounts. For 10 samples for inorganic, nutrient or metals, depending upon the number of parameters requested, the time is less, about 1.5 hours. Time is also needed to generate the bench data sheets on the printer, which can add to the time if there are many of them.

Special chain of custody or enforcement samples need much tighter controls as far as access to the samples and related data is concerned. They must be secured in a locked refrigerator and the paperwork must be kept in a locked file. For cases that get to court, much time photocopying lab books and similar documents is consumed.

Samples that are shown to be high in toxic or hazardous compounds require special treatment. If possible, the volume is reduced; but the sample cannot be merely dumped. It must be kept is a special disposal drum for removal to an approved disposal site. It is important, therefore, excessive amounts of a sample not be taken.

13.3 INORGANIC SAMPLE PREPARATION AND ANALYSIS

The parameters listed in this section are given on the Physical and General Inorganics and Ion Chromatograph Analysis Required sheet. They are the type of analysis that give only one answer per sample and are the simplest and quickest to run. The sample preparation steps are fairly quick; each of the parameters may use one or several of the steps. The basic preparation steps include weighing and/or measuring, filtration, and instrument calibration. Conductivity, pH, and turbidity only require instrument calibration. Methods that use titration techniques, such as total alkalinity or hardness, acidity, chloride, sulfate, sulfide, and the species of carbonate requires reagent standardization, and accurate measurement of the sample. Cyanide and fluoride require filtration in addition to the above steps.

The turbidimeter, conductivity meter, and pH meter are the instruments used for their respective parameters. They require initial calibration with a known amount of standard, periodic calibration checks during the analysis of the samples, but no accurate volume measurement of samples. Conductivity also requires temperature adjustment of samples. These parameters are the most rapid to perform; if sample preparation and calibration are included, about 10 samples of each parameter can be done per hour.

Titrations involve more careful aliquot measurement of samples, in addition to preparation of standards and reagents. They generally rely upon end-point detection to quantify amounts. The end-point detection is done by color indicators or determined by ion specific probes, as for the sulfide determination. They are also fairly rapid to report; about 10 samples of each parameter can be analyzed per hour. Alkalinity and hardness are determined titrimetrically.

The ion chromatograph is similar to a liquid chromatograph in that several different species of ions can be analyzed with one injection. At the present time, only sulfate and chloride are regularly determined with the instrument. Sometimes cyanide samples are run to confirm values from a different technique. In the future, sodium, potassium, calcium, and magnesium will be determined on the ion chromatograph to expedite data reporting, rather that using the atomic absorption spectrophotometer. As with the above procedures, about 10 samples can be analyzed per hour.

A point to remember with all parameters is that if the samples are especially dirty and foul, they will probably require more than one analysis, possibly even 3 or more. In addition, an extremely dirty sample can contaminate the instrument and it would need purging or cleaning before more samples could be run. When several parameters are determined simultaneously on the same instrument, if one parameter is beyond the working limits of the standard curve, the sample must be analyzed again. This can bog down the final reporting process.

13.4 OXYGEN DEMAND, SOLIDS, AND NUTRIENTS

The oxygen demand analyses, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) require the least amount of equipment to perform, but require a large amount of chemist's time to do. They are both titration techniques, using colorimetric endpoint detection. BODs require many BOD bottles, and a large incubator. Each sample is set-up in 3 levels of dilution and in duplicate, and allowed to incubate for 5 days, or longer if the method specifies. When the samples are set, the initial oxygen level is determined, and then other bottles are titrated after the incubation period. When preparation time is considered, it takes about 1 hour per BOD sample. CODs do not require incubation, but they do require digestion on a hot plate for about 4 hours. They are also titrated to measure the amount of oxygen consumed in the digestion process. As with the BOD, it takes about 1 hour for each sample.

The solids parameters also do not require much in the way of exotic equipment. What is needed is a balance (accurate to 0.0001 gm), a drying oven, and a muffle furnace capable of achieving temperatures of in excess of 400°C. Most of the time needed to perform these analyses is in the drying or igntion steps rather than hands-on chemist time. Total Dissolved Solids (TDS) and Total Solids (TS) need to be evaporated overnight, while 2 hours' drying time is enough for Total Suspended Solids (SS), Volatile Solids (TVS), or Volatile Suspended Solids (TVSS). But TVS and TVSS both need a 2 hour ignition time in a muffle furnace after the initial drying step. All solids samples must cool down in a desicator before weighing for an hour after drying or ignition . The amount of hands-on time needed for TDS, SS, and TVS for 10 samples is about 1 hour; for TS, 30 minutes are needed, and 90 minutes are needed for TVSS. These times must be added to the drying and ignition times to arrive at the total analysis time. Percent Total Solids needs only about 15 minutes for preparation of 10 samples, but needs to dry overnight. The other solids parameters are done infrequently.

Most of the nutrient parameters are analyzed on the Technicon AutoAnalyzer II (AAII). Four of the parameters, dissolved ortho phosphate, nitrate-nitrite nitrogen, nitrite nitrogen, and ammonia nitrogen, are analyzed simultaneously. Cyanide and fluoride are also analyzed on the AAII. Kjeldahl nitrogen and total phosphorus require a digestion step before final determination. Kjeldahl nitrogen is then analyzed by the AAII, but total phosphorous is determined manually using a spectrophotometer. The first four parameters listed must first be filtered and transferred to small sample cups for analysis. A great deal of care must be used to prevent cross-contamination of samples during this process. The cups are next loaded onto a sampler and all four parameters are analyzed simultaneously on the same sample.

If one of the samples is beyond the linear range of the calibration curve, the sample must be run again. To analyze 10 water samples that are not particularly dirty requires almost 4 hours. Much of this time is set-up and preparation time; when more samples are done, the amount of time needed increases, but not proportionally. For Kjeldahl and total phosphorous analyses, about 6 hours are needed for 10 water samples, due to the digestion time.

All of the above parameters are reported by manual methods. The raw data is read from the instrument and then transcribed to the bench data sheet. Calculations are then performed on the data using factors that are listed on the sheet.The values are verified by another person before being given to the data records person for entry into the computer. This can lead to occasional clerical errors, but not very often. It is very slow and tedious, and adds more time to the total analysis procedure. If there are a great many samples, reporting can be a very large percentage of the total time.

13.5 METALS

Metals analysis involves a great deal more preparation than any of the previously mentioned parameters. A digestion step is necessary for all metals analyses, except the drinking water parameters, and that step can take a great deal of time if the samples are very dirty, or contain a lot of organic matter. The degree of effort needed for sample preparation increases from water samples up through soil/sediment/ sludge, tissue, oil/solvent, and EP TOX. If there is a large amount of organic matter, digestion must continue for a few hours until the samples are ready. They must be watched closely and more acid and/or other reagents are added as needed. The samples are then diluted to a known volume and then run on the atomic absorption spectrophotometer (AAS).

The AAS is automated for analyzing samples. An aliquot of the sample is transferred to a sample cup, and then the cup is put into the sampler. Metals run with the graphite furnace atomizer are fully automated. The initial instrument parameters are set, and the furnace automatically cycles through the proper drying, ashing, and vaporization steps for each sample and also does the desired amount of rinsing of the sampling probe to eliminate contamination. However, every time a new element is wanted, the lamp must be changed and properly aligned before the automated steps can be followed again. The final reporting step is also not automated. Although the microprocessor in the instrument can perform the calculations, the data still has to be manually transcribed to the bench data sheets and verified before they are given to the records person.

The amount of time needed to do 10 water samples for the priority pollutant elements, which consists of 13 different metals, is about 32 hours. For program workgroups that require more or fewer metals, the amount of time is proportionally greater or less. Sample matrix will also increase the time needed. With tissue samples, the amount of preparation time can increase by a factor of 4 or more if the desired tissue has to be disected before it can be digested. So a set of 10 fish tissues for a hazardous waste workgroup of 24 metals would probably take about 2 weeks to complete. Additionally, if there are severe matrix interferences, the sample would have to be done by the method of standard additions, which involves spiking 4 sample replicates with increasing levels of the metal in order to graphically obtain an answer by extrapolation.

EP TOX metals for soils require a large amount of time for extracting the soils with a water solution and repeated checking of pH. For this reason, 10 EP TOX soil samples require about 6 days to complete.

13.6 ORGANIC PRIORITY POLLUTANTS

The organic chemicals analyses as performed by the Gas Chromatograph (GC) or Mass Spectrometer (GC/MS) give several parameters for each sample run. The main limitation as to the number of compounds that can be determined at one time is the number of compounds in the calibrating standard, and the quality of the resulting chromatogram. They are very complex analyses that requiring a great deal of time in all aspects of analysis- preparation, analysis, reduction and reporting. Additionally, very low levels of pollutants are routinely searched for, so extra caution is used to prevent cross contamination. Because very low detection limits for a large number of compounds are readily produced, analysis by these methods seems to be in high demand. Unfortunately, the capacity is finite, and limited largely by the number of persons available to work on the analyses.

The preparation of samples for analysis is a lengthy process. Only organic solvents can be safely injected into the instruments, so the samples have to be extracted from their original medium, and also concentrated to enhance detection limits. To avoid damage to the GC columns and enhance detection limits, additional cleanup of the samples may be necessary. Water samples are the quickest to extract; if there are no physical problems during the extraction, such as emulsions, 10 samples can be extracted is about 6 hours. When a set of samples are extracted, QA/QC samples, such as duplicate spikes and blanks are co-extracted in addition to the samples. If there are problems, the extraction could take from 8 to 10 hours, since the emulsions must be eliminated at each step before proceeding to the next one. Soil and sediment samples are extracted by continuous extraction using a Soxhlet extraction device, which extracts samples in a permeable, cellulose thimble by refluxing heated solvent from a reservoir for several hours. As many as 24 samples, blanks, and spikes can be extracted at the same time, but each requires further cleanup using gel permeation chromatography (GPC). GPC separates the compounds of interest from contaminants by a size exclusion process; large, contaminant molecules pass through faster than smaller molecules. GPC can only do two at a time, and needs about 1 hour for each pair of samples. Extracting 10 soil samples takes about 15 hours, including solvent volume reduction. Sludge samples, which are a combination of water and sediment or muck, take more time than soil samples. Tissue samples are the worst. The tissue, if it has been previously disected from the animal, has to be mascerated in solvent 3 times using a high-speed homogenizer, and then reduced in volume, followed by GPC cleanup. They take the longest amount of time and effort, about 2.5 days or more for 10 samples. Before final volume reduction, the sample is split if both GC and GC/MS analyses are to be done.

Compounds that are similar to the compounds of interest are added to the samples prior to the extraction process to monitor extraction efficiency; they are called surrogate spikes. A GC separaates compounds based on the different length of time a compound may spend in a column before elution into the detector. When the samples are ready for the GC, they are injected manually or automatically on the instrument. The instruments require daily calibration injections, and the samples must be analyzed on two dissimilar columns to confirm the presence of a target compound, i.e., compound present in the standard. Under conditions identical to the injection of the standards, compounds positively identified in samples have the same retention time as in the standards. The raw data must be transcribed and calculated on bench data sheets to be reported. Pesticides, PCBs, and herbicides are measured on GCs. The herbicides also require an additional step to chemically change (derivatize) it into a compound that can be more reliably chromatographed. Considering only optimum conditions, 10 pesticide samples take 30 hours to analyze, PCBs take 24 hours, and herbicides take 45 hours. These times are increased the more complex and dirty the matrix.

There are a total of 5 GCs in use at the Region 10 Lab. They are used for the analysis of pesticides, PCBs, and herbicides. Each sample has to be injected twice on a GC on dissimilar columns in order to confirm the presence of a target compound. Each day that samples are run, a series of calibration standards must first be injected; they would include about 5 pesticide standards and 2 PCB standards. Three of the GCs have electronic data processors with them, while the other two use strip chart recorders. The chromatograms have to be reduced manually by measuring peak heights or areas. The data for the two GC runs are transcribed onto individual data report sheets prior to reporting the answers for a set of samples. On a best case basis, to analyze and report 10 samples, plus their blanks and spikes, two working days are required. If one or more dilutions must be made to get the samples on scale, then the time needed could take 4 or 5 days.

In the lab, there are 4 GC/MS instruments; two are dedicated to analyzing the the base-neutral/acid (BNA) fraction and two are dedicated to analyzing volatile organic samples (VOA). Since there are several of these high-power instruments, one could naively assume that the Manchester Lab can produce data faster than the field personnel can send samples in to feed it; alas, that is very far from the truth. In the first place, not all of the steps necessary to report data are automated. It is true that the data system can automatically search for, find, quantify and report target compounds in a sample. However, there are many manual verification and bookkeeping steps also involved with the samples and other essential tasks that are part of the total analysis but not visible to the person requesting the data. The GC/MS analyst also must visually verify the presence of a compound by inspection of the mass spectra, calculate the concentrations, verify and calculate tentative compounds, calculate recoveries of the surrogate spiking compounds (which are indicators of extraction efficiency), archive the data on magnetic tape, collate the data for a set of samples, and perform several other relatively minor, but critical, jobs related to record keeping.

QA samples and procedures require much more time than on other analyses. Before any samples can be run, the instrument must pass certain tests. The mass calibration is checked by injecting a reference compound into instrument. If the instrument mass calibration meets certain specifications, then a standard must be injected. The standard contains selected target compounds that are either System Performance Check Compounds (SPCC), or Continuing Calibration Compounds (CCC). The SPCC compounds must exceed a minimum response factor (RF) value to demonstrate the GC/MS is functioning satisfactorily. The CCC compounds must have an RF that is within ± 25% of the average RF of the initial five standard calibration curve. When these requirements are met, then regular analyses can proceed.

QA samples, such as blanks and spikes, are also run; they can account for at least 30% of the total number of runs, and some months have been as high has 65%.

The amount of time required to analyze 10 water samples for the BNA fraction, assuming the most optimum conditions, including blanks, standards, and spikes, is about 45 hours. Samples that need more than one injection per sample, and have many tentative compounds to report, may take twice or more as much time.

The VOA analysis by GC/MS is similar to BNA considering the instrument calibration. The actual sample preparation is much shorter. The target compounds are removed from the sample matrix by a purge and trap procedure that is a part of the instrumental analysis. The compounds are purged from the sample onto a trap by a stream of He gas for several minutes. A valve is switched, and the compounds are backflushed from the trap onto the GC column, where they are cryogenically concentrated at the top of the column. Thereafter, they are analyzed by a similar process as the BNA samples. Ten water samples that don't require dilution can be analyzed and reported in 35 hours; soil and sediment samples need a little more time because they have to first be weighed and the percent moisture determined. Solid samples that need extraction with methanol and then 2 or more analyses would need at least 3 times the amount of time.

The Manchester Lab also has two high performance liquid chromatographs (HPLC). This instrument can be used for any compound that is too unstable to be analyzed by GC. It is also useful for compounds that have a high boiling points and tend to degrade on a GC column during analysis. It can be used for other compounds that would normally need to be derivatized chemically before analysis on a GC. The HPLC is also useful for analyzing some compounds that are normally determined by GC/MS, but all of the other priority pollutant compounds are not wanted; sample turnaround times can be reduced. The HPLC uses a ultraviolet or fluorescence (or both) detector. The disadvantage of the HPLC is that it is not at sensitive as a GC, nor is it as selective as a GC/MS for PNAs. The HPLC is currently set up to analyze the polynuclear aromatic hydrocarbons (PNAs or PAHs); pentachlorophenol (PCP) has also been analyzed on it. The amount of time needed to analyze 10, relatively clean, water samples is about 20 hours; this includes extraction, analysis (one sample per hour), reduction and reporting. If the samples are dirty and/or have high levels of PNAs, then about twice as much time is needed.

Purgeable halocarbons and trihalomethanes are also analyzed on a GC, but are kind of a hybrid of a GC and a VOA analysis. The purge and trap method of separation is used, as with a VOA, but the detector used is a Hall Electrolytic Conductivity Detector, not a mass spectrometer.The Hall detector can detect compounds with halogen atoms, but not other aromatic (benzene) or aliphatic (unsaturated carbon and hydrogen) compounds. The raw data is recorded on chart paper with the chromatogram and a initial quantitation also printed. It can't detect benzene compounds unless they are halogenated. About 24 work hours are needed to analyze 10 water and QA samples; as with all the rest, more time is needed for highly concentrated samples.

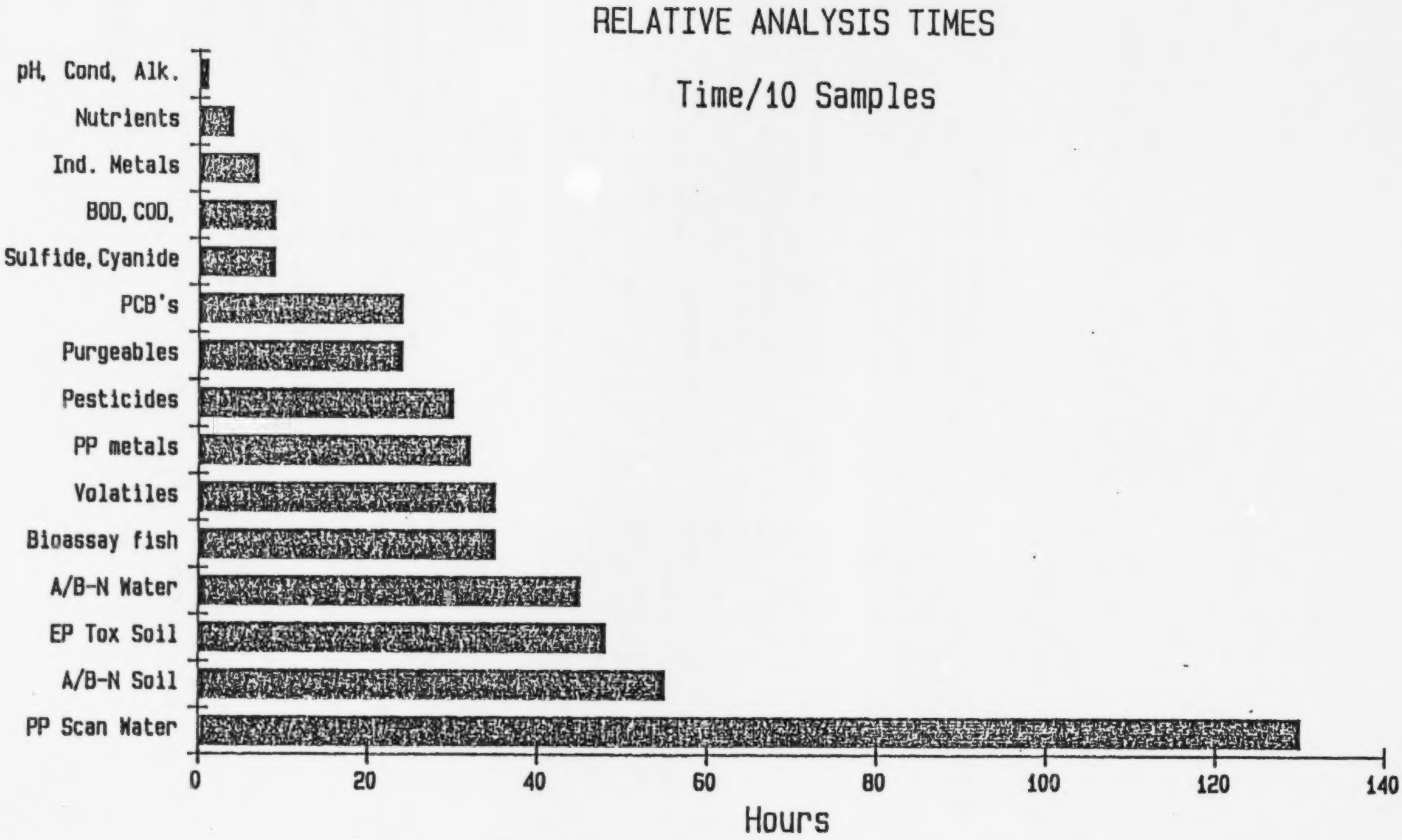
13.7 ALLOCATION SYSTEM

The mission of the Manchester Laboratory is to meet the analytical needs of the EPA and WDOE programs. Nearly all of the EPA work performed at the laboratory comes from the Region 10 program offices, and all resources at the lab come from program elements controlled by the programs. It is therefore important that the programs have some method of determining whether they are getting their money's worth.

A laboratory allocation system is being developed that will tie laboratory activities directly to the FTE investment made by the programs. A program that contributes more FTE resources to ESD and the lab will receive a proportionally greater share of the laboratory's sample output. The initial system will allocate based on general program (air, water permits/compliance, etc.) and work station (GC/MS, nutrients, pesticides, metals, etc.) in a given time period. For example, Superfund might have an allocation of 10 BNA scans per month.

The programs will be in control of their allocation. Operation Offices will have to coordinate their needs with the programs for lab time. It is clear that not all programs will use their entire allocation during each allocation period. It is even clearer that during some periods, some programs will need more lab time than they are allocated. One person will be designated in each program to coordinate allocation. In addition to deciding how best to use the lab capacity available to the program, that person will also be expected to project future use. The Regional Sample Control Center will collate current and projected usage information and assist in "brokering" lab time. Laboratory analyses are expensive and the need for this service is vital. While it is not expected that the "brokering" process will be particularly time consuming, it will probably be quite active.

The allocation system is a new initiative. If only the EPA lab were involved, implementation of the system would be challenging with a real likelihood that many adjustments would be necessary before the system was working smoothly. Because the Washington Department of Ecology is located and even integrated with EPA laboratory activities, this period of adjustment will be even more interesting.



RELATIVE ANALYSIS TIMES

Time/10 Samples